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Land Tenure in the Hashemite Kingdom of Jordan

By GABRIEL BAER*

DURING the last decade the interest in land tenure problems, especially of underdeveloped countries, has grown steadily. This was natural as defects in the agrarian structure have rightly been considered as one of the main obstacles to economic development. The Middle East is no exception to this rule. Yet, because of lack of statistics, only vague information on land tenure in most of the Middle Eastern countries was available up to the middle of this century. No such statistics could have been published for some of the countries of the "Fertile Crescent," since no proper registration of property rights was ever carried out by the Ottoman Government up to World War I, and the new mandatory governments had to lay the foundations for a completely new land registry. By the middle of the century, only 50% and 40% respectively of the total agricultural area of Iraq and Syria had been registered according to ownership. The situation in Transjordan, however, was much better. By 1950 more than two thirds of its agricultural lands had been registered, and as of now land registration is almost complete. In 1950 the Government of Jordan published, in Arabic, some data on land tenure in Transjordan in its *Statistical Abstract.*[1] But, in addition to certain statistical deficiencies,[2] the 1950 figures did not cover the Palestinian districts incorporated in the Hashemite Kingdom, where more than half the population of the Kingdom lives. In these areas only a few sample studies of land tenure had been made during the Mandatory period. This gap has now been filled by the publication of the first census of agriculture in the Hashemite Kingdom, which was taken in 1953 with the assistance of the United States Technical Cooperation Service.[3] The purpose of this article is to analyze this new census and to compare its results with data on land tenure in other countries of the Middle East, particularly with

* School of Oriental Studies, Hebrew University, Jerusalem. Currently on research leave in London, England.

[1] The Hashemite Kingdom of Jordan, Ministry of National Economy, Department of Statistics, *Statistical Abstract 1950.*

[2] The data on land tenure in the 1950 *Statistical Abstract* have been analyzed by the writer in an article on "Land Tenure in Transjordan," *Hamizrah Hehadash* (The New East), quarterly of the Israel Oriental Society, Spring 1952, pp. 233-241 (in Hebrew, with English summary).

[3] The Hashemite Kingdom of Jordan, Ministry of National Economy, Department of Statistics, *1953 Census of Agriculture* (A Joint Project of the Hashemite Kingdom of Jordan and the U. S. Technical Cooperation Service of Jordan. No date of publication mentioned).

those of the Israeli census of Arab agriculture taken in 1949 and 1950.[4]

Total Area and Types of Ownership

It would serve no useful purpose to compare the figures for the total area given in the new census with those of the 1950 *Statistical Abstract*—not only because of the latter's deficiencies but also because of insufficient definitions of the former. For instance, Table 2 of the census (holdings by tendre and size) shows a total of 6,265,105 dunums[5] for the five districts of Transjordan and of 4,244,943 dunums for the three districts of Palestine—together 10,510,048 dunums for the whole Kingdom. But nowhere does the census show if, how much and where lands have not yet been registered; neither do we find any indication of what types of lands are included in this table, whether private property only or lands owned by the state and *waqf* lands as well. It may be assumed that it does not comprise much of the State Domain (land owned by the state but serving no public interest and therefore transferable) at least in Transjordan where it has been the policy of the government to dispose of all its tillable lands to private cultivators.[6] On the other hand, farms on *waqf* land[7] probably have been included in private farms. This is of no significance in Transjordan where, according to the 1950 figures, *waqf* lands did not amount to more than 0.03% of the total registered area but it may be of importance in the Palestinian districts. The fourth type of ownership, Public Domain (land the ownership of which is vested in the State, but since it is of public use of some kind, as for example, roads, rivers, etc., cannot be disposed of), is nowhere mentioned in the new census. In 1950 it amounted to 95,239 dunums in Transjordan, i.e., 1.5% of the total registered area. No comparable data have been published for the three Palestinian districts but there too public domain does not seem to have occupied a much larger percentage of the total area.[8]

The area of State Domain in Transjordan, however, is given in a table of "Basic Statistics" published together with the census.[9] This enables us to draw some conclusions on the relative extent of State Domain in this part of the Kingdom in comparison with other countries of the Middle East. The figures for Transjordan are summarized in Table I.

TABLE I—STATE DOMAIN IN TRANSJORDAN
(in dunums)

District	State Domain	Forests	Total	% of Total Area*
'Ajlun.....	243,888	516,552	760,440	23.4
'Amman.....	51,953	65,817	117,770	8.4
Balqa'.....	636,633	258,304	894,937	49.9
Karak.....	526,663	270,667	797,330	43.8
Ma'an.....	66,177	2,926	69,103	11.1
Total.....	1,525,314	1,114,266	2,639,580	29.6

* Computed by the writer on the basis of the assumption that the total of our Table I plus the total of Table 2 of the census equals the total agricultural area.

If we are right, then, in assuming that no State Domain is included in the figures of Table 2 of the census, state lands in Transjordan cover almost 30% of the total agricultural area., i. e. the total area of the country minus the built-

[4] Census of Agriculture 1949/50, Part A. *Farm Economy of Arabs, Druzes and other Minority Groups.* Government of Israel, Central Bureau of Statistics and Economic Research, Jerusalem, December 1952, Special Series No. 8 (Hebrew, with English summary).

[5] One dunum equals 1,000 square metres or 0.247 acres.

[6] *Cf.*, A. Konikoff, *Transjordan, An Economic Survey* (Jerusalem: Economic Research Institute of the Jewish Agency for Palestine, 1946), pp. 34-35.

[7] Land permanently excluded by a special deed from any kind of transaction (sale, inheritance etc.), the income being dedicated to a beneficient purpose either immediately or after extinction of a specified series of beneficiaries.

[8] *Cf.*, A Granott, *The Land System in Palestine* (London: Eyre and Spottiswoode, 1952), p. 101-2.

[9] No figures are given for the three districts of Palestine where according to a footnote, state domain has not yet been settled.

up area of towns and villages and deserts proper (but including lands on the fringe of the desert, the so-called *mawat*, grazing grounds, etc.). At first glance this appears to be a high proportion of Transjordan's lands but comparison with other countries of the Middle East shows that it is in fact one of the lowest in this area. In Iraq, State Domain (*miri sirf*) amounted to 61.6% of all lands surveyed up to February 1951,[10] and in Syria it covered 40% of all lands registered up to the end of 1952, excluding *mawat* land which was assimilated to State Domain in 1952 and land which may be recaptured by the state under other provisions of the 1952 decree.[11] Only in Egypt has State Domain amounted to a much lower percentage of the total registered area, 17.0% in 1950. There are two principal reasons for the lower percentage of State Domain in Transjordan than in Iraq and Syria (and for the still smaller proportion of State Domain in Egypt). First, land settlement and registration has been carried out faster in Transjordan than in Syria and Iraq (in Egypt it had been completed by 1907) and therefore the Transjordan government began earlier to transfer cultivated and cultivable state land into private hands while the Syrian and Iraqi governments were still claiming and recovering lands illegally occupied and appropriated by various persons (the most prominent among them being bedouin shaikhs). Secondly, Iraq and Syria have larger cultivable but not yet cultivated reserves of land (which form the main part of lands registered in the name of the state) and therefore a lower density of population in relation to the cultivated and cultivable area (53 persons per sq. km. in Iraq in 1947 and 82.5 persons per sq. km. in Syria in 1951, as against about 100 in Transjordan in 1952 and 539 in Egypt in 1947).[12] Thus pressure on the government to dispose of its lands was higher in Transjordan (and much higher in Egypt) than in Iraq and Syria.

Yet, in spite of the continual transfer of state land in Transjordan to private landowners, the area of State Domain grew steadily. But the increase in size was accompanied by a change in the composition of the State Domain: while cultivable lands were disposed of, the state appropriated all lands whose possession by individuals it considered harmful, especially forests. In 1936 State Domain extended over 1,781,000 dunums, including only 43,000 dunums or 2.4% of all forest reserves.[13] By 1950, according to the *Statistical Abstract*, State Domain (probably excluding forests) had decreased to 1,542 268 dunums but in the meantime 600,000 dunums of forests had been registered in the name of the State between 1934 and 1943.[14] By 1953, as shown in Table I above, the area of forests belonging to the State had almost doubled while a further small decrease occurred in the area of other State Domain. Forests constitute today more than 40% of the total area of State Domain.

Holdings and Properties

Table 2 of the 1953 Census of Agriculture is headed: "Number and Area of Holdings and the Total Area in Holdings by Tenure and Size of Holding." Before going into its detailed analysis some general observations are in order to

[10] International Bank for Reconstruction and Development, *The Economic Development of Iraq* (Baltimore: The Johns Hopkins Press, 1952), p. 179.

[11] International Bank for Reconstruction and Development, *The Economic Development of Syria* (Baltimore: The Johns Hopkins Press, 1955), pp. 55; 354.

[12] As a basis for calculating the density per sq. km. of cultivated and cultivable land we used population census figures where available, and the estimate of the cultivated and cultivable area of Prof. A. Bonne which is based on many estimates by various authors. *Cf.*, A. Bonne, "Land and Population in the Middle East," *The Middle East Journal*, Winter 1951, p. 55.

[13] Konikoff, *op. cit.*, p. 34.

[14] *Ibid.*, p. 35.

dissipate a certain existing confusion about land tenure statistics in the Middle East. Such statistics generally relate to land ownership and do not indicate the size of farms as operated by the farmers, which may include land owned by them, land rented from other owners, land tilled by them under the share-cropping system, etc. The source of confusion is the indiscriminate use of the term "holding," as meaning alternately property or unit of operation.[15] It would be more accurate to use the term "holding" only where units of operation are shown and not in relation to properties, i.e., units of ownership. Holdings in this sense, i.e., units of operation, are shown only in the four following censuses: the agricultural census of Egypt,[16] of Iraq (1952-53),[17] of Jordan (1953), and the above mentioned census of agriculture taken in 1949 and 1950 in Israel. Throughout the following analysis the term "holding" will be used only in relation to units of operation as shown in these censuses while the term "properties" will be used where units of ownership are concerned.

Since the figures published in the 1950 *Statistical Abstract* of Jordan relate to ownership while the new census shows units of operation, different sets of data are to be expected. Some interesting conclusions, however, may be drawn from a comparison between the two. In the following table we have added up the new figures for the Transjordanian districts (no data on Arab Palestine are to be found in the 1950 Abstract), and arranged some of the size groups in order to make them comparable and calculated the percentages.

The first noteworthy feature of this comparison is the much smaller total number of holdings than of landowners. This may have two main reasons: first, a property scattered over different villages may have been counted as several properties but as one holding;[18] secondly, in order to circumvent the Muslim laws of inheritance and to prevent land from leaving the family with the girl on her marriage, many landowners in Transjordan have in the past registered a part of the property in the name of a son. Thus, on an average, two members of each family appear as landowners,[19] while the census of agriculture probably considered a family holding as one unit. On the other hand, the total area of holdings in 1953 was slightly larger than the area given as privately owned in 1950. In view of the insufficient definitions of the types of land included in each of the two statistical summaries we shall not try to explain this difference. Nonetheless, the effect of the smaller number and slightly larger area of holdings is the much larger size of the average holding compared with the average property (130 dunums as against 65). Very much the same results are obtained by comparing the data for properties and holdings in Egypt, as published side by side in the Agricultural Census of 1939 (p. 8).

[15] *Cf.*, United Nations, *Land Reform, Defects in Agrarian Structure as Obstacles to Economic Development* (New York: United Nations Department of Economic Affairs, 1951). This publication explicitly distinguishes between the statistics for India (on "holdings") and for Egypt (on ownership) but in another publication, *Progress in Land Reform* (New York: United Nations Department of Economic Affairs, 1954), the same Egyptian statistics are headed "Distribution of *Holdings* According to Size."

[16] Kingdom of Egypt, Ministry of Agriculture, *Agricultural Census of Egypt, 1939* (Cairo: Government Press, 1946). All other Egyptian statistics, such as those published annually in the *Annuaire Statistique*, show distribution of properties, not of "holdings."

[17] Government of Iraq, Ministry of Economics, Principal Bureau of Statistics, *Report on the Agricultural and Livestock Census of Iraq, 1952-1953* Vol. 1 (Baghdad: Al-Akhbar House, 1954). This census, however, shows only the distribution of the number of holdings according to size and the average size of holdings in different provinces and not the distribution of the total area of holdings according to size.

[18] This is known to be the case in Egypt.

[19] Report by H. M. Government to the League of Nations on the Administration of Palestine and Transjordan, 1936, p. 326. Quoted by Konikoff, *op. cit.*, p. 38.

TABLE II—DISTRIBUTION OF LAND OWNERSHIP AND HOLDINGS IN TRANSJORDAN ACCORDING TO SIZE: 1950 AND 1953

Size Group Dunums	Properties 1950			Holding 1953		
	No. of Owners	Area in Dunums	% of Area	No. of Holdings	Area in Dunums	% of Area
Less than 100	76,686	2,121,923	36.3	30,965[1]	1,334,652[1]	21.3
100–200	7,847	992,386	17.0	9,263	1,289,022	20.6
200–500	4,336	1,257,403	21.5	6,227	1,787,580	28.5
500–1000	951	644,680	11.0	1,228	799,806	12.7
1000–2000	269	359,789	6.2	304	400,539	6.4
2000–5000	100	277,781	4.8	119	330,172	5.3
More than 5000	17	188,695	3.2	28	323,334	5.2
Total	90,206	5,842,657	100.0	48,134	6,265,105	100.0

[1] 10-100 dunums. No figures are given for area of holding smaller than 10 dunums. Their number amounted, according to the basic statistics of the census, to 9,892.

But the parallelism does not end at this point. Although the size groups are not the same in the Egyptian and in the Transjordanian statistics,[20] a comparison is possible if we arrange these groups in three classes: small, medium size, and large holdings and properties. In both cases the number and area of small properties are much greater than those of small holdings, while in the medium and large size groups there are more holdings than properties and holdings cover larger areas than do properties. In Transjordan this difference between the number and area of holdings and of properties is greatest in the medium size

[20] The area necessary for a family's living is about 3-5 feddans in Egypt and about 60-100 dunums in Transjordan, except in intensively irrigated areas.

TABLE III—NUMBER AND AREA OF HOLDINGS AND PROPERTIES IN EGYPT CLASSIFIED BY GROUPS OF AREA FOR 1939: AREA IN FEDDANS[1]

Size Group	Properties			Holdings		
	Number	Area	% of Area	Number	Area	% of Area
1 feddan or less	1,751,587	701,857	12	373,692	153,180	3
Above 1–5	571,133	1,191,097	20	432,428	975,386	16
5–10	84,609	568,641	10	100,142	684,853	11
10–20	40,494	549,120	9	50,543	689,081	11
20–50	21,179	645,828	11	27,683	833,947	14
50–100	6,770	467,396	8	8,778	604,914	10
100–200	3,154	443,762	8	4,053	556,113	9
Above 200	2,324	1,269,045	22	2,744	1,539,405	26
Total	2,481,250	5,836,746	100	1,000,063	6,036,879	100

[1] 1 feddan equals 1.038 acres or 4,201 sq. metres.

groups (especially the 200-500 dunums group). The considerable difference in the large size group in Egypt may be the result of lack of differentiation between large and very large properties and holdings.

The first and obvious reason for this phenomenon is the smaller average size of properties which has been explained in connection with Table II. Thus holdings automatically come under larger size groups than do properties. But this alone would not explain the fact that the greatest difference in Transjordan is found in the medium size groups unless it is assumed that larger properties are not as scattered as smaller ones or that their owners do not register family holdings in the name of more than one family member—assumptions that lack proof. An additional explanation therefore is to be sought in the changes that occur through lease of land. The new census divides the area of each size group of holdings into three categories: area owned by holder, area rented from others, and area "held under other tenure forms." Unfortunately, the census nowhere states what "other tenure forms" are but for our purposes it will be sufficient to distinguish between the area owned by the holder and that part of his holding by which he augmented his property to become a larger unit of operation (i.e., the second and third categories). By consolidating size groups and calculating the percentages for the five districts of Transordan we obtain the following table:

TABLE IV—Percentage of Area Owned and of Area Rented or Held Under Other Tenure Forms in Transjordan by Size of Holding

Size Group of Holdings	% Owned	% Rented or Other Tenure
Less than 100 dunums.....	78.0	22.0
100–1000 dunums.....	66.6	33.4
More than 1000 dunums...	80.6	19.4

Thus medium size holdings (100 to 1000 dunums) contain the largest percentage of land not owned by the holders. This may explain why the difference between the area of medium size holdings and properties (as shown in Table II) is greater than that between the area of large holdings and properties. The fact that, although large and small holdings contain similar percentages of owned land, small holdings cover a smaller area than do small properties while large holdings extend over a slightly greater area than large properties would seem to indicate that the main portion of land rented by the medium size holders comes from small and not from large landowners. But, since the census tells us only about the area of land rented by each size group from others and nothing about the area leased by each size group to others, such a conclusion cannot be illustrated by figures. Of all land tenure statistics in the Middle East, only the 1949 and 50 census of Arab agriculture in Israel has tackled this problem. The results were shown to be as follows:

This Table shows clearly: (a) that small holders own more land than they farm; (b) that about half the land leased to others is leased by holders of less than 30 dunums; (c) that almost half the land rented from others is rented by medium size holdings of 50-150 dunums;[21] and (d) that holders of very large farms neither lease much land to others nor rent much land from others but generally farm the land they own. To judge by the circumstantial evidence of Tables II and IV, an inquiry carried out on similar lines in Transjordan would probably lead to similar results. Since it is generally taken for granted that the predominant pattern of tenure relations in the Middle East is the lease of large properties to

[21] Because of the more intensive character of agriculture in Israel, different definitions of small, medium size and large holdings have to be applied than in Transjordan.

TABLE V—ARAB LAND TENURE IN ISRAEL 1949/50 (AREA IN DUNUMS)

Size of Holdings	Area of Holdings	Area Owned by Holders	Area Leased to Others		Area Rented from Others	
			Dunums	%	Dunums	%
5–9	10,359	18,641	9,436	17.5	1,154	1.0
10–19	28,727	35,570	11,306	20.9	4,463	3.9
20–29	32,971	33,917	6,267	11.6	5,321	4.7
30–39	35,772	34,470	5,182	9.6	6,984	5.7
40–49	36,134	32,664	3,374	6.2	6,844	6.0
50–74	78,825	65,551	4,355	8.1	17,629	15.5
75–99	65,207	51,941	2,940	5.5	16,206	14.2
100–149	89,386	72,222	4,745	8.8	21,909	19.2
150–199	49,566	38,759	1,904	3.5	12,711	11.1
200–499	74,359	63,206	3,185	5.9	14,338	12.6
500–999	12,661	8,938	1,046	1.9	4,769	4.2
1000 +	15,461	13,560	293	0.5	2,194	1.9
Total	529,428	469,439	54,033	100.0	114,022	100.0

peasants in small units of operation, it would be interesting to find out to what extent this opposite trend—the lease of small properties to holders of medium size farms—exists in other countries of the Middle East and why small proprietors have recourse to such an operation.

The difference between distribution of ownership and of holdings has yet another aspect. Charts of the relationships between percentages of number and area of holdings and between percentages of number and area of properties in the different size groups will show greater inequality in ownership of land than in holdings. Thus, in Transjordan half the area is owned by only 7% of the owners while half the area of holdings is operated by more than 10% of the holders (the properties and holdings of 200 dunums and above). In Egypt 1% of the owners (the owners of more than 20 feddans) in 1939 owned about half the area of all properties while 1% of the holders (the holders of more than 50 feddans) operated only 45% of the area of farms.[22] These results however may be misleading. As we have seen, the large holdings extend over a greater area, absolutely and relatively, than properties of the same size. The apparently contradictory evidence of equality charts is the result of the much greater number of small properties than of small holdings which reduces percentages of the number of properties in the higher size groups. In view of what we have said about the pattern of tenure in Transjordan, the distribution of holdings would show greater inequality than that of ownership were it not for the fact that the number of small owners as shown in the statistics is much higher than their real number. The figures on land tenure in Arab farms in Israel fully confirm this conclusion: here one third of the holders (the holders of 50 dunums and above) operated 72.8% of the farm area but owned only 66% of the land.

[22] *Cf.*, note to the same effect, in relation to India, in *Land Reform* (U. N.: 1951), p. 9.

Distribution of Land Ownership and of Holdings

Notwithstanding these differences between distribution of landownership and of holdings, the new census confirms previous conclusions about land tenure in Jordan: it shows that a major part of Jordan's land is held in small and medium size farms. In this respect Jordan differs considerably from other countries of the Middle East. According to the figures published in the *Statistical Abstract* of 1950, 36.3% of the privately owned area in Transjordan was owned by proprietors of less than 100 dunums, 49.5% by proprietors of 100-1000 dunums, and only 14.2% by owners of large estates (1000 dunums and above). As against this 67.1% of the private land surveyed up to 1951 in Iraq was in large estates of more than 1000 Iraqi dunums,[23] and 34.2% of Egypt's landed property was in 1950 (before the recent agrarian reform) in the hands of a few landlords owning more than 40 feddans each. But comparison even with Syria, whose agricultural conditions were more like those of Jordan, leads to the same results: 49% of the privately owned land covered by the survey up to the end of 1952 was in estates of more than 1000 dunums.[24] The new census reveals that large holdings too are fewer in Jordan than in most of the other countries of the Middle East. In 1952 and 53, 24.9% of the farm area in the Hashemite Kingdom (Transjordan and three districts of former Palestine together) was covered by small holdings of 10 to 100 dunums, 55.2% by medium size holdings (100-1000 dunums) and only 19.9% by large holdings (more than 1000 dunums). In Egypt, on the other hand, 45% of the farm area was held in 1939 by holders of more than 50 feddans each. While in 1953 the average area of a farm in Jordan amounted to 114 dunums, the agricultural census of Iraq taken in the same year put the average size of a holding at 204 mesharas, i.e., 510 Jordan dunums. The only agricultural census of the Middle East showing a still smaller percentage of the farm area covered by large holdings and a still greater percentage held by small farmers is the 1949 and 50 census of Arab farms in Israel. In Israel Arab farmers of more than 500 dunums held only 5.3% of the farm area (and farmers of more than 200 dunums, 19.3%—slightly less than the percentage of the area covered in Jordan by farms of 1000 dunums and above!) On the other hand, small farmers of less than 100 dunums held 54.4% of the area (and those of less than 50 dunums, 27.2%—still more than the larger category in Jordan).

Generally speaking, the relative predominance of small and medium size properties and holdings in Jordan may be explained by the absence, in Transjordan at least, of the main factors which brought about, in the course of the last 100 years, the concentration of large estates in the hands of landlords in some of the neighbouring countries. The most important of these factors were: (a) in Syria and Iraq many influential bedouin shaikhs succeeded in registering large tracts of land formerly occupied by their tribes as their own private property. When cereals began to be grown as a cash crop, shaikhs became ever more eager to extend their private land property as a source of a larger and ex-

[23] International Bank for Reconstruction and Development, *op. cit.*, (Iraq), p. 142. An Iraqi dunum, or meshara, equals 2.5 Jordan dunums (0.62 acres).

[24] According to International Bank for Reconstruction and Development, *op. cit.*, (Syria), p. 354-355. The writer has doubts about the accuracy of this figure, since exactly the same percentages for the different size groups as given in the report of the IBRD for 2.2 million hectares surveyed up to the end of 1952 had been given for 1.5 million hectares surveyed up to 1944 in a booklet published in 1949 (H. Najjar, *turathuna al-ijtima'i wa'atharuhu fi-z-zira'a*, Beirut: 1949, p. 32, quoting figures published by the Cadastral Survey for 1944). However, this inaccuracy does not impair our general conclusion.

panding income. (b) Growing ties of the *fallaheen* (peasants) with the neighbouring towns led, in the course of time, to indebtedness of the peasants to urban merchants. Gradually the *fallaheen* lost part or all of their land, being unable to pay the usurious interest in addition to their debts. Thus, for example, some merchants of Homs and Hamah in Syria became the owners of a great number of villages near these towns. Agricultural crops in Transjordan, on the other hand, generally were not grown by the peasants as cash crops but for their own subsistence only. (c) One of the main causes for the emergence of large landlords in Egypt was totally absent in Transjordan: namely, the sale of uncultivated state lands to capitalists and land companies for the purpose of reclamation and amelioration. In Transjordan also there are no plantations similar to those in Egypt (for instance, sugar plantations), which were owned by Egypt's richest landowners and partly operated on a large scale.

Moreover, in Transjordan as in many hilly areas of the Middle East, (for instance parts of Lebanon, Northern Iraq, etc.), small properties and small farms remained predominant because the peasants of hilly areas did not come into close contact with urban merchants as much as other peasants who became indebted and forfeited their land. Another reason is the unsuitability of hilly lands for agricultural operation on a large scale. In this connection it is interesting to note that an official estimate of the Syrian government put the percentage of the area of small properties (less than 100 dunums) in the mountainous Jebel Duruz at 33%, of medium size properties (100-1000 dunums) at 53%, and of large properties (more than 1000 dunums) at 14%—a distribution resembling very much that of Transjordan.

Nevertheless, there exist considerable differences in the distribution of landed property and of holdings according to size between the various districts of the Hashemite Kingdom; and it would be wrong to say that there are no large estates or extensive farms in Jordan. Both the 1950 statistics and the 1953 census reveal that conclusions reached by writers during the forties on land tenure in Jordan (and in Palestine) must be revised to a certain extent, either because they had to rely on estimated averages or because differentiation gained momentum only in the later years of that period. The table on page 196 shows the degree of differentiation in the various districts of the Kingdom.

The most interesting aspect of this table is the distribution of holdings in the Palestinian districts of the Kingdom, for which the census figures of 1953 are the first ever published. It shows a sharper differentiation in Palestine than in Transjordan: a greater percentage of the area is covered by large and by small holdings, and a smaller one by medium size holdings. In view of the much smaller part of the area covered by large holdings in Arab farms in Israel (see above), their relatively large percentage in the Palestinian districts of Jordan is astonishing, the more so as the districts of Palestine which were incorporated in the Hashemite Kingdom lie in the hilly part of the country while most of the plains are part of Israel. This might be explained by the fact that many large landowners left their places or remained outside Israel after the establishment of the State of Israel and their properties were farmed, at the time of the census, by small farmers renting their land from the custodian. But the most surprising figure is the really high percentage of large farms in the district of Jerusalem where the area occupied by large estates had always been

TABLE VI—DISTRIBUTION OF HOLDINGS (1953) AND OF PROPERTIES (1950) IN THE HASHEMITE KINGDOM OF JORDAN ACCORDING TO DISTRICTS (% OF AREA)

District	Holdings 1953			Properties 1950		
	10–100 Dunums	100–1000 Dunums	More Than 1000 Dunums	Less Than 100 Dunums	100–1000 Dunums	More Than 1000 Dunums
Transjordan						
Ajlun	26.8	59.3	13.9	49.8	41.3	8.9
Amman	15.1	46.5	38.4	31.6	40.1	28.3[1]
Balqa	21.4	69.0	9.6	36.5	45.3	18.2[2]
Karak	20.7	68.5	10.8	24.5	66.8	8.7
Ma'an	11.7	85.8	2.5	11.4	80.4	8.2
Palestine						
Nablus	32.0	51.8	16.2			
Jerusalem	27.1	36.0	36.9			
Hebron	32.5	50.1	17.4			
Total	24.9	55.2	19.9			

[1] Amman subdistrict only.
[2] Subdistricts As-Salt and Ma'daba.

thought to be among the smallest in the whole country.[25] According to the figures published in the census, eight landowners of Jerusalem district held 440,838 dunums —more than a quarter of the whole farm area of the district—all owned and none rented by them from others. Available data are too scarce for an attempt to analyze this phenomenon. On the other hand, the emergence of large estates and farms in the neighbourhood of the capital, Amman, seems to have been the result of growing ties with town merchants, a parallel development to what happened near Homs and Hamah in Syria some decades ago. In Amman district about 90,000 dunums are held and owned by three persons. It is interesting to compare these figures for Amman with the practically total absence of large farms (and the small percentage of large properties) in the barren South (Ma'an). In the northernmost district, Ajlun, the predominance of small peasants was a well known fact but the new figures for holdings show a certain shift in the distribution towards larger units. This is the largest district of the Kingdom, covering almost a quarter of the whole farm area of Jordan and almost 40% of the farm area of Transjordan. Therefore figures for distribution of landownership and holdings in Ajlun determine to a large extent the distribution pattern of Transjordan as a whole.

Some final comments should be made on the question of landless peasants in Jordan. This does not seem to have been a major problem in Transjordan before the late forties; and one author even maintained that "the number of persons in the villages entirely without land is negligible."[26] The recently published figures, however, indicate that the number of landless peasants cannot be neglected any longer. According to the

[25] *Cf.* Y. Shimony, *'Arvi Eretz Yisrael* (Tel-Aviv: 'Am Oved, 1947), p. 168; J. Waschitz, *Ha'aravim be-Eretz Yisrael* (Merhavyah: Sifriyat Poalim, 1947), p. 44.

[26] Konikoff, *op. cit.*, p. 39.

1952 population census, Transjordan had 586,885 inhabitants, 146,939 of whom lived in Amman, Irbid and As-Salt—the only three towns of more than 10,000 inhabitants (all the other so-called "towns" are large villages, and even in Amman, Irbid and As-Salt quite a considerable portion of the population is occupied in agriculture). There remains an agricultural population of about 440,000 (the 1950 *Statistical Abstract* estimated the agricultural population at 455,400, out of a total of 600,000). On the assumption that the average family in Transjordan has as many members as the Palestinian Arab or Iraqi rural family, i.e., six persons, there must be about 75,000 rural families in Transjordan. The number of holdings, however, amounted to 58,000 only (see Table II above and note to same Table). Some 20% of the rural families therefore have no holdings at all. These may include some of the Palestinian refugees but most of those refugees who do not live in camps settled in towns. Not much better is the plight of most of the 10,000 holders whose farms are smaller than 10 dunums. Together these two categories constitute about 35% of the rural population. These conclusions are corroborated by an interesting table published in the 1950 *Statistical Abstract* under the heading "Situation of Employment." According to this table, 30% of the gainfully employed rural population "work for others" and 70% "work for themselves." Thus the old pattern of land tenure in Transjordan—all peasants having their viable plot of land and nobody owning much more than necessary for his subsistence—seems to have been disturbed by recent developments, although polarization certainly has not reached the extreme severity which exists in Egypt or in Iraq.

Feather River Water For Southern California†

By JAMES C. DEHAVEN* and JACK HIRSHLEIFER**

THE FEATHER RIVER PROJECT, one of the largest water resource schemes ever proposed by any authority, will, by all indications, be constructed in the near future under the sole initiative and control of the State of California. The project is the first and central component of the California State Water Plan—a grand, or even grandiose design for geographically redistributing the waters of California. To give some ideas of magnitude, conjectured cost figures for the Feather River Project run around one and a half billion dollars, and for the entire California Water Plan, thirteen billion dollars.

The immediate purpose of this paper is to estimate the role which water supply from the Feather River Project should play, if rational economic considerations governed, in the calculations of Southern California. That is to say, we are trying to produce the kind of a report which the responsible Southern California authorities should insist upon before deciding whether they are willing to bear—or rather, have their constituents bear—the additional cost required to enlarge the Project to allow deliveries to Southern California.[1]

In addition to acting as uninvited research staff for Southern California, we do have a larger purpose, relating to the economics of the Feather River Project as a whole—and, still more important, to the planning process which has led to the project and to the State Water Plan. Before the project can be accepted as economic, the sort of calculations attempted by us for Southern California in terms of the alternatives available to that region should be repeated for each of the separate service areas. The difficulty of this process, especially in regard to the estimation of demand, constitutes an insufficiently appreciated argument for a greater degree of decentralization in water planning. When the gains from correct decisions and the burden of mistaken ones both fall upon those interests actually making the decisions, motivations toward economic rationality should be stronger.

One minor point of terminology. When we refer, without qualification, to Southern California, we will ordinarily mean a six-county region including the heavily-populated portions of Ventura, Los Angeles, Orange, Riverside, San Bernardino and San Diego Counties, sometimes known as the South Coastal Area.

I. The Feather River Project: History, Scope, Documentation

The immediate sources of pressure for the Feather River Project seem to fall into two main categories. First, there are a number of regions in California, especially those pumping water from underground basins with declining water levels, which consider themselves seriously "short" of water. Most conspicuously on the western side of the San Joaquin Valley, the basic economic activity (irrigation agriculture) and the associated industrial and municipal developments are said to be in danger of decline as the cost of water from local or nearby sources rises steadily. Such areas have naturally turned to govern-

† The material on which this article is based was originally prepared for and presented at the meeting of the Econometric Society, at Cleveland, Ohio, December 27, 1956.

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[1] A complication of some importance for this analysis is the fact that the allocated cost to Southern California is not the true incremental cost. This will be taken up later.

ment for assistance. Without considering the possibility that this decline might well be a reasonable consequence of the exhaustion of an economic resource of the regions in question, the California state water authorities (now the Department of Water Resources) have presented a "solution" for this and all future water problems in the California Water Plan—a plan for redistribution of water supplies to meet the "ultimate requirements" of all areas of the state. The water authorities of the state bureaucracy constitute the second pressure interest pushing the Feather River Project as the initial and central unit of the State Plan. Other affected areas have also been interested, since any proposal for augmentation of water supplies is an important question in California. Rational public discussion, however, has been at a minimum, with practically no one challenging the proponents' argument that each area has a certain "need" or "requirement" for water, cost being no object.[2]

In 1951 a Feasibility Report[3] on the Feather River Project was submitted to the California legislature, which in that year authorized the project. Perhaps because there was no immediate intention to start construction, the inadequacy of the Feasibility Report was overlooked. By February 1955 a more serious document, entitled *Program for Financing and Constructing the Feather River Project as the Initial Unit of the California Water Plan*,[4] was submitted to the legislature. The Bechtel Corporation was retained by the legislature to prepare an independent review, and their report[5] is the second basic document relied on in this analysis, the first being the Program just mentioned.[6]

A major difficulty for critical analysis is that a single aqueduct route and associated delivery system have not yet been agreed upon, so that the bulk of the reports in question are devoted to the geologic or engineering details of some ten to twenty variant schemes under simultaneous consideration. Nevertheless, the schemes all have in common certain features, which we may list: (1) Construction of Oroville Dam in north central California on the Feather River, at a cost of some half-billion dollars. Upon completion, this will be the largest dam in the world. (2) Conveyance of water generally southward, at a cost of around one billion dollars, the major consumers to be the Central Valley area (Fresno, Kings, and Kern Counties) and, eventually, Southern California. The maximum length of the system is 740 miles, 150 in river-bed and the remainder in aqueduct. This will be the longest aqueduct in the world. (3) Associated power developments, of such magnitude as to be of substantial importance.

The State Program was almost completely silent on the economics of this vast Project, though some summaries called "Financial Analyses" were presented. Essentially, the Program calcu-

[2] An example of this thinking from an official report is as follows: "It is believed that the cost of water will not be a limiting factor in ultimate development of the water resources of California . . . . It is indicated that urban communities will always be able and willing to pay the cost of water to meet their municipal needs. Furthermore, it is considered probable that under pressure of future demands for agricultural produce the water necessary for a greatly-expanded irrigation development will be provided, at whatever cost may be required." State Water Resources Board, Bulletin No. 2, *Water Utilization and Requirements of California*, V. I., June 1955, p. 37.

[3] State Water Resources Board, *Report on Feasibility of the Feather River Project and Sacramento-San Joaquin Delta Diversion Projects Proposed as Features of the California Water Plan* (May 1951).

[4] Division of Water Resources, *Program for Financing and Constructing the Feather River Project as the Initial Unit of the California Water Plan*, February 1955.

[5] Bechtel Corporation, *Report on the Engineering, Economic and Financial Aspects of the Feather River Project*, San Francisco: December 31, 1955.

[6] A critical paper of great interest is E. Neuner, Jr., "Economics of the Proposed Feather River Project," *Proceedings* of the 31st Annual Conference of the Western Economic Association, August 30-31, 1956 (Salt Lake City: University of Utah Press, 1957), p. 20.

lated for each route an (incorrectly) allocated cost for each service area, and then simply assumed that demand would be such as to absorb the contemplated deliveries at this supposed "cost." For the main two service areas under the State's basic route (High Line from Delta to Barrett Reservoir), the calculated costs (and the assumed average revenues) were $8 per acre-foot for Fresno, Kings, and northern Kern Counties and $45 per acre-foot for the South Coastal Area of Southern California. There was no calculation of the present value or over-all rate of return for the project, although a table was presented showing that over 70 years the *undiscounted* annual revenues would substantially exceed the *undiscounted* annual costs. Interestingly, contributions from the state's general fund to cover annual deficits were included in the "revenues." On the other hand, the annual costs were overstated in failing to credit any "salvage value" after the termination of the assumed project life of 70 years, and no value was attached to the anticipated flood-control benefits.

This performance was in some respects improved in the Bechtel Report. Incidentally, it might be questioned whether an organization like Bechtel, with a tremendous financial interest in approval of large-scale construction programs, was really the appropriate selection for an unbiased review. In terms of intellectual competence, however, the Bechtel Report is impressive, though showing marks of extreme haste. The most important part of the report for our purposes is the Appendix on the demand for water prepared by economists at Stanford Research Institute. While the SRI analysis was negative on the prospect of water sales in some areas, their basic conclusion was that the two *major* service areas referred to above could conservatively be expected to take their allotted deliveries at the allocated-cost prices as recalculated (following the same erroneous principle) by Bechtel. These prices, incidentally, in the Bechtel Report are $9 per acre-foot for the Central Valley counties, as opposed to $8 in the State Report, and range from $28.69 to $43.66 (depending on route and delivery points) for Southern California as opposed to $45 in the State Report.

These purported "cost" prices do not, however, generate enough revenue to cover the aggregate cost of the project.[7] While we do not wish to imply that we accept the idea that water prices *should* be based on some allocated average cost, it will be worth our while surveying the over-all economics of the project under this principle of the State Program and the Bechtel Report. Average-cost prices should, of course, generate aggregate revenues equal to total cost. Using the Bechtel figures for State Route 1, we have discounted to time 0 of the Project the annual flows of net revenues (gross revenues less operation and maintenance costs) on the one hand, and construction expenditures on the other. In this present-value calculation we implicitly rather than explicitly charge for interest on capital invested. And, of course, bond amortization is not considered a cost. We assume no salvage value of the project after its official life of 70 years and ignore flood-control benefits (these assumptions will be re-examined later).

Carrying out this calculation, discounting at the rate of 2.7% assumed as the State's borrowing rate in the Bechtel Report, we find that the present value of the cost stream is some $1,241,000,000, and of the revenue stream $1,079,000,000 —on balance a present value of *minus*

[7] This has been pointed out by Neuner, *loc. cit.*, p. 21, though his calculations differ in some respects from ours.

$162,000,000. This result is presented in Table I, together with the results of similar calculations for two Bechtel alternate routes on which sufficient information to base the calculations is provided. The 5% interest results will be explained later.[8] The indicated prices cannot then be average-cost prices—the disparity may be due to the treatment of General Fund contributions as "revenues," but the information presented is so inadequate that it is difficult to say for certain.

The most interesting divergence between the Program and the Bechtel Report was the conclusion of the latter that, aside from certain unevaluated flood-control benefits, economic considerations would dictate delaying the construction of Oroville Dam for some twenty years, at which time water deliveries to Southern California are supposed to begin. The reason is that the low-water flow of the river suffices to meet the indicated water demands until that time. (A dam, of course, does not create water, but so regulates it as to permit under ideal conditions year-round use of the average-flow rather than low-water flow.) The cost calculations shown above take this delay into account.

Our independent calculations indicate, however, that when flood-control benefits are included there is a small advantage in favor of early construction—discounting at 2.7%, the power revenues and flood-control benefits slightly more than offset the extra capital and operating costs of early construction. At a 5% discount rate, late construction becomes preferable.

II. Incremental Cost of Southern California Water

In this section we attempt, to the extent possible with the limited information provided, to carry out an inde-

[8] These figures do not represent a full consideration of the costs and benefits of the project. We shall provide, however, some indication of the magnitudes of the major elements excluded from the present value calculation above. At 2.7%, and using the late construction schedule, Appendix Table B shows the flood-control benefit to be $25,440,000. The salvage value shown there is $35,258,000, but this refers only to the capital costs incremental to Southern California. A rough allowance for the other capital costs brings the salvage value for the entire project to $39,000,000. The present value of the costs less offsets for Route 1 is then $1,176,300,000; and the adjusted net present value rises algebraically to *minus* $97,200,000. For Route 8A the adjusted net present value becomes *minus* $46,200,000, and for Route 10A *minus* $45,900,000.

TABLE I—PRESENT VALUES OF THE FEATHER RIVER PROJECT[1]

	Costs	Receipts	Net Present Value	Net Present Value, Adjusted[2]
At 2.7%				
Route 1	$1,240,723,000	$1,079,086,000	$−161,637,000	$− 97,200,000
Route 8A	1,122,918,000	1,012,301,000	−110,617,000	− 46,200,000
Route 10A	1,029,277,000	918,933,000	−110,344,000	− 45,900,000
At 5%				
Route 1	1,035,393,000	515,435,000	−519,958,000	−501,770,000
Route 8A	860,606,000	445,384,000	−415,222,000	−397,030,000
Route 10A	799,128,000	408,536,000	−390,592,000	−372,400,000

Route 1: State High Line Route to Barrett Reservoir.
Route 8A: Bechtel High Line Route to Devils Den and Coastal Route to Terminal at Granada Hills Reservoir.
Route 10A: Bechtel's High Line Route to Quail Lake Terminating in Granada Hills Reservoir.
[1] *Source of Data:* Bechtel Report, pp. 150, 152, 153.
[2] Adjustment credits flood-control benefit and salvage value. See Footnote 8.

pendent calculation of the average incremental cost of Southern California water deliveries—as opposed to the average allocated cost principle followed in both the State Program and Bechtel Report. The allocation principle used there for project elements providing benefits jointly to several areas is called "proportionate-use," each area being assessed a fraction of the fixed costs for any year equivalent to its fractional share of that year's output. One seriously objectionable feature of this procedure is that areas other than Southern California would bear the full fixed costs of the project until deliveries commence to Southern California—in spite of the fact that the size and capital cost of these facilities are larger than they would have been in the absence of Southern California demand. In fact, if Bechtel's analysis is correct, Oroville Dam would not be constructed at all were it not for the Southern California demand. In order to determine the average incremental cost, for each project feature we have made at least a rough estimate of the incremental cost assignable to Southern California.[9] Specifically, we assigned the entire Oroville dam cost to Southern California, though when we offset against this cost the prospective power profits and flood-control benefits due to the dam, the net cost was small.

Our analysis relates to the state's basic Route 1—State High Line to Barrett Reservoir. While this is a high-cost route by official estimates, Route 1 brings the water to the areas of most intense demand in Los Angeles and San Diego Counties. The average incremental cost we derive will, of course, be somewhat too high for the more northerly delivery points and too low for the more southerly within Southern California.

[9] Details in Appendix.

In terms of these considerations, and assuming of course that the Southern California extension is properly an increment (that is, that the remainder of the Project would be built in the absence of Southern California deliveries), we estimated the average incremental cost using the equation:

$$\sum_{t=1}^{70} \frac{xq_t}{(1+i)^t} = K + P + O + R + G - Z - F - S$$

Here x is the unknown average incremental cost of Southern California deliveries; q^t represents the deliveries in the year t; K is the present value of incremental construction costs; P of the incremental power costs; O of the incremental operating cost; R of the incremental replacement cost; G of the incremental general expense; Z is the present value of the offsetting power revenue; F of the flood control benefit; and S is the discounted salvage value. This last is the estimated value of the continued stream of benefits after the end of the official project life (70 years). It will be noted that we assume that a market for the deliveries will exist at the unknown price x.

TABLE II[1]—Our Cost Estimates for Water to Southern California

	Dollars per acre-foot	
	State Schedule (early construction)	Bechtel Schedule (late construction)
At 2.7%		
Standard deliveries	$47.76	$48.18
Full-capacity deliveries[2]	44.44	44.83
At 5%		
Standard deliveries	82.93	75.65
Full-capacity deliveries[2]	75.10	68.51

[1] For details, see Appendix Table B.
[2] Figures shown are lower bounds.

Our basic result of $47.76 per acre-foot in Table II is rather surprisingly close to

the comparable Bechtel figure of $41.61 and state figure of $45.00. These computations are based on the state construction schedule; under the Bechtel construction schedule our cost figure is $48.18. Actually, however, this similarity of result is the accidental consequence of several offsetting variations. We substantially increased the cost by our larger dam allocations to Southern California and by refusing to count General Fund contributions as revenues. We decreased it by allocating as an offset the flood-control benefit (recognized, but not credited in the other reports), and crediting the salvage value.

We now should say something about the pricing policy itself. We do not endorse average incremental cost pricing —indeed, it appears that such pricing would lead to considerable economic waste here. Since water-transport projects have a fairly well-defined "capacity," we might assume with some confidence that marginal costs are very low until capacity is reached, at which point they begin to rise very steeply. Under these circumstances, a rational pricing system would very probably (though not necessarily) be such as to lead to full utilization of the aqueduct capacity. We have, accordingly, recalculated the average incremental costs on the assumption that prices will be so adjusted as to keep full capacity operations at all times. Strictly speaking, however, we are only showing a lower bound on these adjusted figures, since we have not increased any of the operating costs to correspond to the increased deliveries. Even so, the cost reduction is small—the figure corresponding to our $47.76 above being $44.44.

Actually, all these cost estimates are much too low for an entirely different reason: the state's supposed borrowing rate of 2.7% is far lower than the marginal productivity of capital in other employments. This disparity is due (1) to the federal income-tax advantages of state bonds, (2) to the use of the general state credit rather than revenue bonds (the latter would command a higher interest rate corresponding to investors' estimates of the real riskiness of the project), and (3) to the exemption of state-owned properties and enterprises from all local and federal taxes (of particular importance here, in providing an enormous "profit" on power operations).[10] Taking these factors into account might require an opportunity-cost rate of perhaps 5% to 8%, enough to make the cost-benefit ratio enormously adverse and to greatly raise the incremental costs to Southern California. If, however, we are only considering Southern California water alternatives, any of which would benefit by similar hidden advantages, we will not take this really dominating consideration further into account.

One incidental implication of the similarity of our incremental-cost figures to those developed by the state and Bechtel is that the state subsidy shown by our earlier calculations is not going to Southern California.[11] In the absence of the Southern California sales, the subsidy would stand out much more sharply—so it might well be that the project would not in fact be undertaken if there were no prospect of Southern California sales.

[10] This point has been particularly effectively brought out in Neuner, *loc. cit.*, p. 24. The generated power is sold at prices reflecting the costs of privately-owned utilities not benefiting from tax exemptions.

[11] Mr. Otto Eckstein, the discussant of this paper before the 1956 meeting of the Econometric Society at Cleveland, has pointed out to the authors that it does not necessarily follow that the other service areas are the ones receiving the subsidy. It may be that the sum of the incremental costs for each of the various service areas falls short of the total costs—so that each area may be paying its full incremental costs, while all together may be the joint recipients of a subsidy.

III. Southern California Alternatives[12]

The water demand estimates made by Stanford Research Institute for Bechtel painted a generally optimistic picture of the willingness of Southern California interests to pay in the neighborhood of $40 or $45 per acre-foot of water in 1976. This picture was based on projected population growth, assumed limitation of ground water overdraft, and increased sewering which would lessen recharge of ground basins. There was no consideration given, however, to Southern California alternatives. Failure to consider such water alternatives in the construction of the Colorado River Aqueduct led to the long period of substantial disuse of the enormous supplies from that source —so there is good historical ground to be careful now.

The alternatives available to Southern California may conveniently be grouped into three categories: (1) economic alternatives, (2) present technical alternatives, (3) future technical alternatives. First, there are economic alternatives to the use of more water if that increment must be purchased at wholesale prices as high as $40 or $45 per acre-foot. Prices so high may themselves act as a brake on the population increase and the rise in per capita use assumed by SRI. (We may remark, parenthetically, that we find SRI's use estimates high[13]—the risky nature of such projections is of course well-known.) Even at present prices, furthermore, there are certain gross misallocations of water which, if corrected, would effectively increase supplies for the more productive uses. Currently, irrigation is responsible for 90% of the state's water use, and irrigation users are typically subsidized at the expense of all others. In municipal systems, large users are probably favored at the expense of small. In addition, the introduction of peak-load premium prices would probably effect a considerable saving. The "requirements" approach to water demand encourages dam construction as the only solution, and neglects such possibilities as the purchase of water rights or the "unitization" of common water pools, both being devices which would shift the resource from low-valued to high-valued uses without any over-all augmentation of supply. The most important possibility here would be a transfer of part of the enormous Imperial Valley irrigation allocation to the growing urban areas of Southern California. Bureaucratic water transfers are both difficult and probably undesirable; what we have in mind is purchase of irrigators' water rights by the more highly valued uses.[14]

All the *economic* alternatives to increased supplies have been grossly neglected in discussions of the Feather River Project. We might expect that the present *technical* alternatives (that is, other ways of providing the supplies) would have received somewhat better consideration than the economic alternatives, but this is only partially the case. The supply alternative of over-riding importance is the re-use of sewage—which is believed to be safe in the present state of knowledge and which would, apparently, provide a substantial supply increment ranging in cost from ten dollars to thirty

[12] The information in this section derives from two main sources. (1) J. C. DeHaven, L. A. Gore and J. Hirshleifer, *A Brief Survey of the Technology and Economics of Water Supply* 2nd. ed. (1955)—a RAND Corporation Study. (2) J. W. Milliman, "The History, Organization and Economic Problems of the Metropolitan Water District of Southern California," a UCLA Ph. D. thesis (1956).

[13] The population shown for 1976 is about 14,000,000 for the 5-county area (Ventura County excluded). See Bechtel Report, p. 91. The rise in per-capita use assumed is subject to serious question.

[14] For Colorado River water alone, Imperial and other irrigators hold rights to some 4,000,000 acre-feet. Current actual use for all purposes in the South Coastal Area is around 2,000,000 acre-feet, about half of this going to irrigators.

dollars.[15] The second important possibility is augmented overdraft. This was considered by SRI only as a negative factor—cessation of overdraft was supposed to create demand for project water. But the high alternative cost of Feather River water will act to induce even greater overdraft than at present. There are, however, both legal and hydrologic complications connected with overdraft which we cannot pursue in detail.[16] Additional local entrapment also appears to warrant further consideration.

Future technical alternatives—possibilities for augmenting supplies not now feasible or economic, but which may become so—have been given no consideration at all, despite the fact that the water supplies promised by the project for Southern California will not be forthcoming for twenty years. The most obvious of these possibilities is atomic power used, possibly, to extract fresh water from the sea. A second important possibility is weather modification. Each of these is a very large question mark. An example of a somewhat less radical but still extremely promising idea is control of evaporation from reservoir surfaces. Monomolecular oil films may sharply reduce evaporation losses at little cost. In general the uncertainties which arise when we consider the future, both on the demand and the supply side, are substantial enough to justify a considerable risk-discount on the anticipated benefits of the Feather River Project.

IV. Conclusions

(A). Southern California faces the Feather River Project in two aspects: first, as a customer and beneficiary of the project and second, as a source of about half of the state's taxes. Under the proposed arrangements, the taxpayers in general are subsidizing the beneficiaries in general through the General Fund contributions. In our analysis of Route 1, it appears that the subsidy does not accrue to Southern California. Detailed study would be required to show whether this applies to other routes as well. This subsidy is much less important, however, than that involved in elimination of risk-premium through the use of the state's general credit. Such risk-shifting enables floating the bonds at a rate like 2.7%, as opposed to what wuold be required if revenue bonds were issued. Actually, the evidence suggests that it would be difficult to sell revenue bonds for this project at any price. Even at 2.7%, water prices based supposedly on average cost of deliveries (and actually somewhat less than that) are high enough as to generate some doubts as to whether the anticipated revenues will be forthcoming. In addition, there are all sorts of other uncertainties—such as the possibility of construction costs being substantially higher than estimated in the basic documents. As soon as we make some allowance for a risk-premium to be paid investors, however, the average-cost prices will rise. It may be that the demand will be sufficiently inelastic so that the higher price will generate enough additional revenues to cover the higher apparent cost, but this is at best doubtful. For the sake of an illustrative calculation, we will assume that revenue bonds could in fact be sold at 5%. Recomputing the average incremental costs of Southern California deliveries under State Route 1, we get the figure of $75.65 per acre-foot shown in Table II.[17] This

[15] Milliman, *op. cit.*, Ch. 8. A potential annual supply of 1,200,000 acre-feet is mentioned. The Feather River Project proposes eventually to supply 1,800,000 acre-feet to Southern California.

[16] Increased overdraft may not be a socially superior alternative, since in pumping withdrawal decisions there is a divergence between private and social cost. In the absence of regulation, however, increased overdraft may be the unforeseen consequence of higher prices for purchased water.

[17] This is the late construction schedule figure, the cheaper of the two at 5%.

compares with the average cost in the state program of $45, in the Bechtel Report of $41.61, and in our previous calculation (using 2.7%) of $47.76 per acre-foot. In a sense, then, the difference between the average-cost price of $75.65 using a 5% discount rate and $47.76 using 2.7% is a state subsidy in the form of transfer of the risk. Southern California taxpayers will be the ultimate bearers of about half of any burden the state incurs as a consequence of assuming these risks.

Even aside from these calculations, the discussion in the previous section revealed the existence of alternatives which should almost certainly be exploited before Feather River water is purchased at the assumed price of $40 to $45, besides which there is the possibility of important changes in technology before 1976. The conclusion seems inescapable, therefore, that Southern California interests should not bind themselves to take project output starting in 1976. They should request that all project components incremental to Southern California be indefinitely postponed until an economic demand develops. They should also call for a cost recalculation—assuming that, in their capacity as taxpayers, they object to subsidizing other areas.

(B). If we now took the different point of view of someone concerned with the overall state economy, and unconcerned with distributional questions between Southern California and other portions of the state, we would not necessarily be worried over the General Fund contribution. It might well be justified on efficiency grounds, for example, to subsidize all beneficiaries in the sense of charging rates insufficient to recover all costs. We would not concern ourselves about the federal subsidy to such public projects. We would still, however be concerned to make some allowance for risk in discounting the benefits and cost of this project. A rate of 5% would not be excessive, in our opinion. When we change discount rates from 2.7% to 5% the present value of the project falls in the algebraic sense from *minus* $161,637,000 to *minus* $519,958,000,[18] using the Bechtel assumed revenues for State Route 1. Subsidies of this magnitude to users might conceivably be justified on efficiency grounds because of certain non-market benefits and costs. For example, there may be considerable consumers' surplus attached to the water deliveries beyond the revenues the consumers actually pay in. Without expressing a final judgment on these matters, it seems dubious as to whether the project can show economic justification. If our analysis of Route 1 holds for the other possibilities as well, removing the Southern California extension of the project will eliminate the project's *best* portion, and so will make the present values for the remainder appear worse relative to the expenditure involved, though somewhat better in an absolute sense.

(C). The citizen not concerned with distributional questions between California and other regions and also neutral between private and public investments would want to discount the benefits at a still higher rate—one based on the alternative productivity of capital in investments elsewhere. The rate of return on investments on the margin of profitability which are receiving no benefits from the federal income-tax exemption of the state bonds, the property tax exemptions of the project physical properties, and the income-tax exemption of project net revenue,[19] must be quite high

[18] At 5% the flood-control and salvage value offsets to cost diminish to present values of $10,940,000 and $7,250,000 respectively, leaving the adjusted net present value at *minus* $501,770,000. See Table I.

[19] This benefit will probably not be significant, as the Project seems unlikely to earn any net income.

indeed. For risks at all comparable to the project, an alternative-opportunity rate of 8% or even 10% might still be conservative.

(D). We cannot do more than comment on the planning process which has led to the recommendation that the Feather River Project be adopted for immediate construction. The natural monopoly aspect of public water supply has tended to dictate public ownership, and the physical interdependence of the rather widespread regions within the same or closely related hydrologic units is tending to shift the control of these projects from decentralized to centralized political units. This process is evidently not without its costs and defects, and it may well be that the case for decentralization in this field has not been properly appreciated, especially in view of the scale of error centralization makes possible.

APPENDIX

Table A of the Appendix summarizes the data used to derive estimates of incremental costs to Southern California. The various columns are described in somewhat more detail below. The calculations are based upon the consideration that construction of Oroville Dam is incremental to Southern California deliveries. We therefore charge the capital and operating costs of the dam against Southern California, but offset against this the power revenues, flood control benefits, and salvage value of the dam. Actually, our calculation at 2.7% shows the *net* dam cost to be slight—the dam is not far from being a paying proposition as a power and flood control project alone. At 5%, however, the net dam cost assignable to Southern California is quite large.

(1) Estimated deliveries in acre-feet (q_t): These are the "standard deliveries" based on the State Program.

(2) Full-capacity deliveries in acre-feet (q^*_t): These are hypothetical deliveries on the assumption that sufficiently low prices are charged to utilize the designed capacity of the system in place.

(3) Capital costs (K_t): These are the construction and related outlays, based upon the state's schedule (Oroville Dam begun in 1956). Bechtel cost estimates are used. Oroville Dam is allocated 100% to Southern California in the years 1957-62. The other major project components are allocated on a proportionate, capacity basis: that is, it is assumed that the capacity increments required for service to Southern California are purchased at the same cost as the non-Southern California capacities. Specifically, we charged Southern California for 46.39% of the cost of Delta Cross Channel in 1968-69 and Intake Channel in 1956-59; for the cost of expanding Pumping Plant IIB from ¼ of capacity to ½ of capacity, of expanding P.P. III from ⅛ to ½ capacity, of constructing P.P. IV, V, and VI to ½ capacity, all in 1973-75; for 49.45% of the Aqueduct from Intake to San Luis Creek, 88% from San Luis Creek to Wheeler Ridge in 1957-58; for 100% of Quail Lake Afterbay and Buena Vista Forebay in 1972-75; for 100% of Aqueduct from Wheeler Ridge to Barrett Reservoir in 1972-76; for increasing the pumping plants listed above to ¾ capacity in 1979-81 and to full capacity in 1984-86.

(4) Power costs (P_t): Prices derived from Bechtel *Report*, p. 50. Requirements from State Program, p. 50, adjusted proportionately for Southern California deliveries.

(5) Operating costs (O_t): From State Program, p. 57, $826,000 estimated as due to Oroville so allocated to Southern California. In addition, all increases in operating costs after 1976 (when Southern California deliveries commence) allocated to Southern California.

(6) Replacement costs (R_t): From State Program, pp. 49, 57, $268,000 estimated as due to Oroville. Increases handled as in O_t above.

(7) General Expense (G_t): On same principles as O_t and R_t, $240,000 assigned to Oroville (State Program, p. 57), increases handled as in O_t.

(8) Power revenues (Z_t): These constitute by far the most important cost offset. In the Route 1 plan, the only power revenues are from Oroville Dam. Based upon data in the State Program (pp. 51, 59, 114), we credited $21 per dependable installed KW year plus 2.75 mills per delivered KWhr. The varia-

APPENDIX TABLE A—ESTIMATED INCREMENTAL COST TO SOUTHERN CALIFORNIA: STATE SCHEDULE

Year of Project	Calendar Year	"Standard" Deliveries q_t	Full-Capacity Deliveries q^*_t	Capital Costs K_t	Power Costs P_t	Operating Costs O_t	Replacement Costs R_t	General Expense G_t	Power Revenue Z_t	Flood-Control Benefit F_t	Salvage Value S_t	Year of Project
1	1956			$101,633,901								1
2	1957			101,633,901								2
3	1958			101,633,901								3
4	1959			56,296,429				$240,000				4
5	1960			56,296,429		$ 856,000	$ 268,000					5
6	1961			56,296,429								6
7	1962			56,296,429								7
8	1963								$14,760,000	1,590,000		8
9	1964								14,768,000			9
10	1965								12,373,000			10
11	1966								12,106,000			11
12	1967								11,981,000			12
13	1968			2,597,840					12,299,000			13
14	1969			2,597,840					14,432,000			14
15	1970								13,236,000			15
16	1971								12,124,000			16
17	1972			127,228,751					12,749,000			17
18	1973			167,186,129					11,979,000			18
19	1974			167,186,129					11,983,000			19
20	1975			167,186,129		856,000	268,000		11,978,000			20
21	1976	450,000	900,000		8,700,000	1,852,000	1,009,000		11,974,000			21
22	1977	540,000			10,400,000				12,552,000			22
23	1978	630,000			12,300,000				13,519,000			23
24	1979	720,000		22,079,583	14,300,000				13,443,000			24
25	1980	810,000		22,079,583	16,000,000				14,626,000			25
26	1981	900,000	900,000	22,079,583	18,100,000	1,852,000	1,009,000		12,041,000			26
27	1982	990,000	1,350,000		20,000,000	1,882,000	1,329,000		14,210,000			27
28	1983	1,080,000			22,200,000				15,443,000			28
29	1984	1,170,000		22,079,583	24,100,000				15,993,000			29
30	1985	1,260,000	1,350,000	22,079,583	26,100,100			240,000	14,689,000			30
31	1986	1,350,000	1,800,000	22,079,583	28,400,000		1,329,000	443,000	12,943,000			31
32	1987	1,440,000			30,300,000		1,609,000		14,035,000			32
33	1988	1,530,000			32,700,000				13,957,000			33
34	1989	1,620,000			34,800,000				12,390,000			34
35	1990	1,710,000			36,900,000				13,386,000			35
36	1991	1,800,000			38,900,000				12,214,000			36
37	1992								14,882,000			37
38	1993								14,500,000			38
39	1994								11,726,000			39
40	1995											40
41	1996											41
..	....											
..	....											
70	2025	1,800,000	1,800,000		38,900,000	1,882,000	1,609,000	443,000	11,726,000	1,590,000	$128,000,000	70
71	2026										3,655,000	71
107	2062										3,655,000	107

APPENDIX TABLE B—PRESENT VALUES OF COST COMPONENTS AND OFFSETS

	State Schedule 2.7%	State Schedule 5%	Bechtel Schedule 2.7%	Bechtel Schedule 5%
Kt	$ 934,477,000	$ 740,972,000	$ 830,613,000	$ 587,973,000
Pt	496,768,000	192,230,000	496,768,000	192,230,000
Ot	39,909,000	20,524,000	31,036,000	13,553,000
Rt	26,269,000	11,971,000	23,491,000	9,789,000
Gt	9,045,000	4,795,000	6,490,000	2,742,000
Sum of cost components..	$1,506,468,000	$ 970,492,000	$1,388,398,000	$ 806,288,000
Zt	319,733,000	175,586,000	203,754,000	89,151,000
Ft	39,748,000	21,554,000	25,440,000	10,940,000
St	32,973,000	6,215,000	35,258,000	6,400,000
Sum of offsets.....	392,454,000	203,355,000	264,452,000	106,491,000
Net Total.....	$1,114,014,000	$ 767,137,000	$1,123,946,000	$ 699,797,000
		Dollars per acre-foot		
x	$47.758	$82.930	$48.183	$75.651
x*	44.438	75.104	44.834	68.511

tion is due to expected annual fluctuation in stream flow as well as gradual depletion of flow over time.

(9) Flood-control benefits (F_t) From State *Feasibility Report*, p. 33. But see Bechtel Report, pp. 23-24.

(10) Salvage Value (S_t): For the dam cost of $365,500,000, the unexpired life at the end of 70 years was assumed to provide annual benefits of $3,655,000 from years 71 through 107. For the non-dam costs of $931,000,000, a lump-sum credit of $128,000,000 was provided at year 70. This was based upon a rough calculation of the undepreciated life of the remaining Project components, both original and replacements.

The considerations above and Table A all relate to the early construction schedule. For the late schedule, the following changes were made:

(1) Capital costs (K_t): The dam cost was shifted from Project 1-7 to years 14-20, the amount so shifted being $56,296,429 for each year.

(2) Operating costs (O_t): The $826,000 shown was supposed to begin in year 19 instead of year 5.

(4) General expense (G_t): The $240,000 shown was supposed to begin in year 18 instead of year 4.

(5) Power revenues (Z_t): All figures shown before year 21 were eliminated.

(6) Flood-control benefits (F_t): the $1,590,000 shown was supposed to begin in year 21 instead of year 8.

(7) Salvage Value (S_t): The non-dam benefit was left unchanged. The annual dam benefit of $3,655,000 was to hold over the years 71 through 120.

Commentary: On "Feather River Water for Southern California"

By EDWARD NEUNER, JR.*

THE ABOVE ARTICLE points up one of the more pressing problems connected with the public development of water projects, namely: What are to be the bases for a decision as to their economic feasibility? It is the approach of the authors to this question which is the concern of this commentator. With respect to the standard of economic feasibility which it is applying, the paper does little more than state that "the immediate purpose of this paper is to estimate the role which water supply from the Feather River Project should play, if *rational economic considerations* govern. . . ." Economic rationality here evidently means conformity with criteria of efficiency in resource allocation, the minimum requirement of which appears to be that the ratio of total discounted benefits to total discounted costs be at least equal to unity.

In applying this feasibility standard, though, the article gives little attention to a primary issue: whether in a real-world situation it is possible to determine the sum of the utilities to be gained or the total of opportunity costs to be incurred. Issue can be taken with what appears to be the effective assumption of the paper, namely that there can be derived from a cost-benefit calculus determinate, quantitative expressions which accurately measure the social efficiency and the "economic rationality" of a particular use of resources. It is doubtful that an approximation thereto could be obtained without at the same time having to resort to so many judgment factors that an objective and definitive solution becomes impossible.

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Many benefits and costs, for example, cannot be fully accounted for, if at all, in the kinds of market-determined prices used in the study. The authors recognize this in one place in their paper but move away from it quickly—perhaps too hastily. Thus, it is stated:

> "Subsidies of this magnitude to users might be justified on efficiency grounds because of certain non-market benefits and costs. For example, there may be considerable consumers' surplus attached to the water deliveries beyond the revenues the consumers actually pay in. Without expressing a final judgment on these matters, it seems dubious as to whether the project can show economic justification."

Actually, the authors have developed no basis for judgment on this or other non-market benefits and their conclusion that the project cannot show "economic justification" (interpreted to mean efficiency or rationality with respect to the allocation of economic resources) is by no means supported.

Two important non-market elements which appear to have been neglected may be noted, assuming common understanding of the "non-market" terminology—namely, those benefits and costs arising from a particular use of resources which are not reflected in the pecuniary valuations of markets functioning under existing institutional arrangements. First, the static assumptions underlying the benefit-cost analysis do not permit recognition of the "developmental benefits" of water projects. This is something the Bureau of Reclamation has been struggling with under the heading of "indirect benefits"—admittedly without much success. Nevertheless, such "developmental

benefits" must be large since the expectation of their realization underlies much of the initiative behind the Feather River Project; it should therefore be taken into account.

Furthermore, the implicit assumption in the paper of full resource employment leads to the neglect of a significant offset to the asserted real costs of the water project. A critical factor in the study's economic evaluation is the interest rate used to assess the opportunity costs of the project. Thus, an alternative opportunity rate of 8-10% is postulated which is a rate associated with the private use of resources. Moreover, it is evidently assumed that a sufficient number of these privately-sponsored alternatives will be continually available. But to the extent that they are not, the consequent underemployment of resources invalidates the the use of such a rate in the determination of real costs and allocative efficiency.

It can hardly be said, given the practical circumstances of the mid-Thirties in Southern California, that the opportunity cost of the Colorado River Aqueduct was very high. Therefore, some adjustment in the opportunity rate assessed against publicly-sponsored projects for the factor of recurring underemployment seems necessary before it can be said that a realistic test of economic rationality has been applied. Adjustments of this character would be most justified if the publicly-sponsored project were speeded up or slowed down in accordance with a greater or lesser degree of underemployment, but it would also be required even if a project were initiated during a full-employment period, provided the project continued through periods of underemployment.

The adjustment factor for the underemployment of resources, however, permits a wide area of judgment, as does for that matter an allowance for "developmental benefits." This is exactly the point: that the implication of the paper that its quantitative balancing of the present value of benefits and costs has somehow been able to establish the lack of an "economic justification" for the Feather River Project is questionable. Rather, it would be argued that the present state and the practical possibilities of benefit-cost analysis are not such that they can provide a definitive basis for rejecting (or, for that matter, approving) the project on the ground of allocative efficiency or economic rationality. The best that may be hoped for is an economic "brief" in which all factors pertinent to a communal decision can be disclosed and weighted with tolerance limits sufficient to accommodate a wide variety of judgments.

In the absence of conclusive evidence as to the economic rationality of a particular resource use, standards of financial feasibility comparable to those which guide private entrepreneurs might be used as the basis for a public decision. Reliance upon such standards might be supported by a belief that private tests of financial feasibility are, in general, more likely to lead to an efficient use of resources than those which might be applied by public agencies. But such a pragmatism does not make the private test of financial feasibility an infallible yardstick for beneficial economic action, nor does it exclude the possibility of serious error. Some adjustment of the results of private tests in particular and socially important cases would be necessary.

It would appear, then, that in developing the bases for a public choice with respect to the Feather River Project the most that can be done is apply a test of private financial feasibility, adjusted for non-market benefits and costs as far as reasonable judgment will allow. On the assumption that non-market benefits and

cost-offsets will be greater than non-market cost additions, the benefit-cost results of a private test will set a maximum, and adjustment for non-market elements will validate a project if it meets a lesser requirement. Such adjustment can be in the form of a reduction of the interest factor used to discount the flow of benefits and costs.

Generally, this is what the paper has done. For in a highly refined present-value analysis it has indicated the benefit-cost balance of the project at two interest factors as well as at a rate which was taken as representative of private feasibility. The information thus developed is of great value in establishing pecuniary valuations in the form of net present value deficits which will, in effect, be assigned to non-market elements if the project is approved.

There can be little criticism to the paper on technical grounds, but its strong suggestion that the existence of a net present value deficit makes the project economically irrational is objectionable.

Land Reform in the Postwar Era

By KENNETH H. PARSONS*

LAND REFORM has again become a major policy issue in this century, after several decades of comparative quiet. This was inevitable, no doubt, as national independence and devotion to national economic development spread so widely over the globe. This happened in Europe as the old agricultural order gave way to the new industrial regime. But now, due to the contest of ideologies, land reform and related matters are issues of international politics and diplomacy.

I.

Land reform programs are directed toward changing the form of man's relation to land, particularly the status of the cultivators. Through land reforms the cultivators acquire the ownership of the land they till, becoming owner-cultivators; or their tenancies become more secure and less costly; or they become members of cooperative or collective farms and so on. The variety of possibilities is very wide; what happens in any country is partly a matter of the particular circumstances of the agricultural economy and partly of the dominant ideas and political philosophy.

Amidst the nearly limitless variety of problems and situations which have produced land reform programs in recent years, a few common elements are to be found. There is the nearly universal fact that peasant cultivators live in poverty or near poverty, regardless of how hard they work. Technological and economic advance of recent centuries has largely by-passed peasants.

It is not only that the peasants have remained poor, it is quite likely that most of them have become poorer generation after generation, for the past two or three centuries. This decline may have been arrested or even reversed in several spots by the educational and development programs since World War II. However, there are enormous influences weighting the peasants down—especially the deterioration of soil and the increase in numbers. The peasants have been the mudsills, so to speak, upon which the social structure of Asia has rested. The dislocations of the village economies due to the intrusion of factory prodcuts and modern methods since the 17th century have resulted in pushing the artisans of obsolete crafts and their descendants back upon the land resources of the villages.

Most of the countries which have neither industrialized nor developed a predominantly commercial type of agriculture—now called underdeveloped—entered the 20th century with a feudal type of economic and social system, or a tribal system still more primitive. Such feudal arrangements varied widely. In some countries there were enormous holdings of land: in prerevolutionary Russia, Hungary, parts of Italy, Egypt and many others. But of greater importance was the fact that social, economic and political power accrues "naturally" to a relatively few families in old societies as land acquires a value from prospective sales of products, as lending becomes secured by pledges of land, as property rights become securely defined and national governments take shape. This is a feudalism of economic, political and social power, not merely of land holding alone.

If there is a constant within these diverse situations it is in the attitude and

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culture of the peasants themselves. There is a deep belief among peasants, whose ancestors may have lived for centuries from particular lands, that the lands and waters which have sustained them so long are somehow theirs—in a rightful sense. The remark of an African chief, as reported by Charles Kinopley Meek, summarizes eloquently the peasants' philosophy of land and civilization: "I conceive that land belongs to a vast family of which many are dead, few are living, and countless numbers are still unborn."[1] To the individual peasant family their hold on the land has long been both the hallmark of their status and the elementary basis of their survival. With sufficient land of their own, some have lived well; without land countless millions have suffered literal starvation. The peasants' attachment to land is not a mere whim or prejudice; it reflects solid judgments of the requirements for survival which have matured through centuries of precarious and rugged living.

It is with such situations as these, or worse, that the leaders of underdeveloped countries must cope if their countries are to move toward economic development—the strengthening of the national economy and the reduction in poverty. What the leaders attempt is very likely that to which their general political or philosophical viewpoints lead them. In some countries the leaders are still trying to hold the lid on; in others, revolutionaries have had, or are having, their day. In more, devoted patriots are trying to make progress through gradual alleviation of the most glaring injustices, inefficiencies, and inequalities.

The land reform programs are among the ways of implementing these basic philosophies of government. It is meaningful, therefore, from the perspective of the American experience to gauge the agricultural policies and recent land reform programs against some of the basic ideas of Western liberalism which have affected our own land policies so profoundly. The Marxist-communist view is one of repudiation—of the basic importance of individual man as well as of the productivity of freedom. In this view, the owners of property in land, including owner-cultivators and small proprietors are considered enemies of the state—to be swept aside making way for the triumph of technology through collective farms. There is a correlative reliance upon bureaucratic administration rather than the rule of law, as we know it. These views have not been applied without qualification in the communist countries; Russia, Jugoslavia, China and the satellite states. But the restraint is evidently attributable to practical rather than ideological considerations. Russia has permitted at least some members of the collective farms to have little dooryard gardens and pastures. Jugoslavia is backing out of the collectivization of agriculture and returning to a more traditional type of peasant farming. China has not yet moved wholly into the collectivist pattern; individual peasants still have their allotments of land but their control is far short of private ownership. However, the eradication of private ownership of land and the collectivization of agriculture, with the thorough subordination of the individual cultivator to the will of the state, are evidently fundamental ingredients of the Marxist-communist policy toward agriculture.

In general, the noncommunist states affirm the historic liberal view that free men are stronger than slaves and that liberty is made secure through the rule of law, mostly through some variety of property rights. This view leads toward

[1] C. K. Meek, *Land Law and Custom in the Colonies* (New York: Oxford University Press, 1947).

increasing the number of owner-cultivators, attempting to assure tenants security of occupancy with fair rents, and so on—in the belief that the independent farmer on a modest-sized farm is a good citizen and an efficient operator, or can be made efficient through education, agricultural credit, cooperatives and other sustaining measures.

It is for such reasons that land reform has become a battleground issue between communist propagandists and their adversaries in so many of the underdeveloped areas of the world. The Marxist-communist line is simple: the economic progress of peasants requires the elimination of the feudalistic landlords and an end to their exploitation. There is enough evidence of inequalities of income and status as well as a sufficient number of grievances in almost any old agrarian society to give this propaganda an effective appeal to the plain people. Such propaganda, fully illustrated by the experiences of former land owners in Russia and China, has undoubtedly stimulated the undertaking of land reform programs in several countries.

In effect, the peasants are courted by all political factions, or parties, in underdeveloped areas, through appeals to what used to be called the land hunger of the peasants. It is well known that communists have ridden to power in several countries by their promises of land to the peasants, which land they so devoutly want. Similarly, the slogan of "land to the tiller" has been used with great effect in Asian politics. The policy of land to the cultivator is one of the cardinal principles of the India Congress Party as well as of the party of the late President Magsaysay of the Philippine Islands.

The demands of the peasants for land of their own have erupted into open revolution on many occasions over recent centuries—the seizing of land by the peasants in Mexico following 1911, for example. More recently there have been sporadic threats and seizures of villages by the embittered peasants in several countries; in Italy, India and the Philippines, and elsewhere. It would be a mistake however to consider contemporary peasant societies as seething with unrest. To the casual visitor the peasant villages of Asia appear calm and even lethargic. Nevertheless, especially under the nationalistic awakenings, the potential is there for unrest with explosive dynamic force, particularly as school graduates return to the villages with little or nothing to do. In fact the fear of the masses, in the cities and in the villages, by the political leaders of Asia evidently serves to give public opinion a very great influence in the halls of government even where genuinely democratic elections are not held.

Before turning to a brief review of some contemporary experiences with land reform programs, it should be noted explicitly that land reform is really an elliptical expression for economic or social reform, focused initially upon changing the way land is held. Land is an integral part, but not the only part, of rural economy. To a peasant engaged in subsistence farming, land is virtually the full measure of economic opportunity for the use of his labor. But the peasant family is rare today that does not market at least 15 to 25 percent of the crops it grows. Most families have some expenses for seeds and other production items. They may very well "sell" most of their crop at or before harvest time in order to pay debts incurred for food purchased and consumed during the growing season. Farm and family form an indivisible unit, even though the use of land may be the most strategic and basic part. This is why land reforms which achieve much, inevitably become con-

cerned with credit and markets as well as land. This also explains why a land reform program may be such a hollow victory for peasants where the control of markets or of credit remains in the hands of an exploitive state.

II.

Land reform came to central and western Europe in the 16th to the 19th centuries, as a part of the social revolutions incident to the emergence of a middle-class society and modern industrialism. In eastern Europe the revolutions of this earlier era failed and a feudal type of agrarian organization was carried over into the twentieth century. These are precisely the areas in Europe where the Communist revolutions and coup d'etats have succeeded most in recent decades. In southern Europe, especially southern Italy and the Iberian peninsula, feudal holdings of land have continued to the present time. Recently the Italian government has undertaken a land reform program, mostly in the south, which is of major significance.

Italy. The social and economic problems of Italy toward which the land reform program is directed are quite similar to the typical problems of underdeveloped areas. Southern Italy especially has remained agricultural. Much of the land was owned in large tracts, sparingly developed and yielding little. The agricultural workers who tilled this land have been only partially employed, poorly housed, living in genuine poverty. Here was also a center of communist party activity in Italy, taking notice of the plight of the peasants and advocating land reform.

Parliamentary consideration of the land reform problem began in 1946. By 1948 a large staff of technicians was at work taking careful inventory of land resources and working out plans for land development and improved use. By early 1950 a general plan for Calabria in southern Italy had been agreed to by the parliament. A short while thereafter the land reform program was extended to other areas.

The land reform program of Italy is directed toward the breaking up of poorly farmed large estates, the developing the land, and the allotting of it to the former tenants and laborers. In the first law, the Sila law for Calabria, the basic exemption was 300 hectares of land owned by one person in the country. Subsequent legislation has provided for a different basis of ownership retention. Expropriation in other areas is not based on size alone. Allowance is made for good cultivation. Although the expropriation centers on large tracts where they are intensively developed and used, the owner may be left as much as 50% of the holding. If the area is not being used effectively, as much as 80% may be taken. The total program anticipates the expropriation of slightly less than two million acres of land, or about five percent of the cultivated area of Italy.

The land taken over is purchased from the owner at the value declared by the owner for tax purposes in 1948. The average price paid per acre is reported as $66 per acre.[2] The land acquired is transformed from near wasteland into improved farms with numerous community facilities, water, schools, etc., before it is allotted to the cultivators. Consequently, the Italian land reform program is a combined land distribution, land development and family settlement program. The settlers are required to pay original cost of the land plus 42% of the cost of improving the farm unit.

[2] See Lowry Nelson, *Land Reform in Italy* (Washington, D. C.: National Planning Association, 1956); also Manlio Rossi-Doria, "The Italian Agrarian Reform," *Land Tenure, Proceedings of the International Conference on Land Tenure and Related Problems* (Madison, Wisconsin: University of Wisconsin Press, 1956), p. 390 f.

Public funds assume 58% of the cost of transforming the land into farms and all of the cost of community improvement of facilities. The end product of the present program will be approximately 100,000 families settled on small farms; the land will be prepared for intensive farming; and the settler will have to farm it well in order to qualify for full and clear title at the end of a 30-year trial purchase period.

An attempt has been made to encourage or induce present holders of the large and near idle areas to develop them through the possibility of retention of a larger share of the holding. This seems not to have been effective, partly through the amount of investment required, but also because a substantial part of the costs of the improvements must be charged off as a social cost.

The land reform program of Italy creates farms through improving and transforming the land. Similar programs are under way in Venezuela and Iraq especially, and are undertaken characteristically wherever lands are reclaimed through drainage or irrigation. Such programs produce land that is relatively expensive in terms of monetary cost, though not necessarily expensive in terms of the real cost where the labor might otherwise be wasted. They have the further merit that this method is less controversial than the redistribution of fully developed lands. Much of the economic opportunity granted to the settler is created by construction and physical transformation of the land.

Egypt. Egypt has two different kinds of land reform programs, each of which has some similarity to the Italian program. One is the development of land previously waste, public domain lands. The other is the distribution of lands already under cultivation. It is the latter which is usually referred to as the land reform (it is now administered by a Ministry for Land Reform and Agricultural Credit) but the development programs are also noteworthy.

One of these land development programs, known as the Earis Program, is designed as a large-scale demonstration of reclamation of coastal swamplands in one province and desert lands in another province, together with village design, resettlement and community development. There are some 33,000 acres of land in this project, upon which some 6,000 landless families will be settled, on five-acre holdings. The land is sold to the settlers at about $2500 per unit.[3] This project was undertaken with American aid, at approximately 40% of the cost, as a development demonstration project and takes its name from the agency for development, the Egyptian-American Service for Rural Improvement. More recently a somewhat comparable project has been undertaken wholly by the Egyptians in the desert west of the Delta, known as Liberation Province.

This program was started in 1953 and work has been prosecuted vigorously as rapidly as water could be made available by diversion from the Nile Valley. Ultimately it is expected to encompass about 1¼ million acres, however its development to this extent is conditioned upon the completion of the high Asswan dam.

The Egyptian program for the distribution of cultivated lands has a basic purpose, like the Italian program, of eliminating large-scale land holdings. Individual holdings of land above 200 acres each are subject to public acquisition; another 100 acres may be retained for transfer to children. Compensation is paid for the land, at 70 times the annual levy, amounting to about $550 to $600 per acre, mostly in 30-year bonds.

[3] The data on Egypt are mostly from unpublished papers given at the FAO-Iraq sponsored "Center on Land Problems in the Near East," October 1955.

However, all of the lands of the ex-royal family, not only of the ex-King Farouk but of all other descendants of Mohammed Ali, were confiscated. No compensation is paid for these "royal" lands. All the requisitioned lands are sold to the previous cultivators of the holding on the basis of cost plus 15% of non-royal lands of comparable grade in allotments which may not be less than two acres or more than five acres per family, again on 30-year terms. At the beginning of the program there were about 2,000 holdings of land in Egypt above 200 acres (feddans) each in all kinds of ownership including waqf (charitable trust) lands. This included approximately 20% of all cultivated land. Of this about one half million acres are scheduled for inclusion in the program, about 8% of all the cultivated land in Egypt. It is noteworthy that the land acquired by the government of Egypt in this program is Delta land and much of it is first rate, the best in Egypt.

The objectives are several, as in the Italian program. To break the power of large landlords and to establish owner cultivators, are major. There are also provisions in the same 1952 law for regulating rents, establishing minimum wages for farm laborers, providing agricultural credit and strengthening farmer cooperatives.

The requirement that the recipients of land must participate in the village cooperative farming enterprise where the land lies in sizable blocks is no doubt the most creative and significant feature of this program. Where the land acquired forms a minimum contiguous area of approximately 800 acres, a cooperative farm is established. Some 20 to 30% of the acquired lands are evidently in holdings smaller than this minimum and are currently cultivated by individual families. The most conspicuous feature of the cooperative farms comes from the acceptance of the community pattern of crop rotation.

Characteristically, in the Egyptian Delta five major crops are grown in a three-year rotation. There are three major summer crops, cotton, rice and corn; and two winter crops, berseem clover and wheat or barley. The double-cropping is possible through the mild weather and irrigated farming. It has been found that the water required for rice will seep into adjoining plots and harm cotton plants growing there. Also the berseem clover plant is a host to cotton worm leaf after some specifiable date in the season. To protect the cotton crop, the main cash crop of the country, it is necessary to grow rice apart and stop the irrigation of clover by certain specified dates each year. These technological requirements have led to the voluntary cooperation of land users in the more progressive villages such that each crop is grown in a large block, even though the ownership units may be very small. One may see a 100 acre field of any one crop which is actually farmed or even owned by perhaps 100 different peasants.

The land reform administration honoring good agronomic practice, therefore, follows the policy of allotting land to each peasant in three separate tracts of ⅔ to 1⅓ acres each so that he may grow a crop in each of three fields. The separate tracts are carefully marked off by steel stakes and are owned or in process of becoming owned by the individual peasant families. The crops are planted, cultivated, harvested, and owned by the family which owns the land, except that certain tasks are done cooperatively and usually mechanically such as the deep plowing for cotton.

The village cooperative is a very inclusive organization. The peasant receiving land is required to join the co-

operative as a condition of his acceptance of land. Each peasant has an account with the cooperative. Against this account is charged his share of the cost of work done on his lands for him by the cooperative. Mostly he markets his cotton through the cooperative; although alternative ways of marketing are allowed. Credit is extended through the cooperative. Collections are made by the cooperative, including payments for the purchase of the land and repayments of other debts, through charges against the peasants' accounts. The management of the cooperative is in the hands of a manager, so far appointed by the land reform administration, and a board of directors elected by the peasant members.

The individual cultivator does not have much choice or discretion in the production of his crop. There is a closely coordinated village farm program, within which there is little room for individual deviation by cultivators when the community requirements of irrigation, drainage and rotation are met. The ownership pattern is subordinated to these technical requirements of cultivation. Each cultivator owns his land and the crop grown on his land. His cotton is picked, weighed, and graded separately. At picking time he gets a certificate of ownership of so many pounds of cotton of specified grade. This preserves the most essential feature of independent farming.

The most controversial aspect is that of management, and here the Egyptians have met an issue which plagues agriculture throughout much of Asia. There is in Asia a searching hope for ways to bring effective modern technology into the agricultural economy. This is one of the reasons back of the wide interest in cooperative farming in India and Pakistan. The Egyptian experiment integrates the village agricultural economy technically and management-wise, while reserving to the cultivator the ownership of the product of his land and labor—subject to the prorata costs.

This suggests the differences between the Russian collectives and the Egyptian cooperatives, which gives the latter their greatest significance. In principle, the Egyptian cooperative is based upon private ownership of land with the use of collective action among individual owners, wherever it is efficient. The Russian collectives are based upon the elimination of both private ownership of land and private ownership of the product of the land in order to make technology efficient.

There will be at least two critical tests of the ideas of the Egyptian land reform program. One test will come when the cooperative farming conceptions are generalized to the villages with small holdings of land. Such an extension was projected as a part of the 1952 law. This extension of cooperative farming has been given active consideration recently, as the land acquisition and distribution programs have progressed. The second test is quite different. This is whether the land requisition program will stop with the present basic ceilings, allowing the ownership of 200 acres of land per person. There has been great apprehension among the land owners of Egypt on this point. Reports from reliable people in Egypt suggest that the restriction of land-holding to 200 acres has stimulated interest by the land owners in better methods of farming. One also hears that the expectations and demands of the tenants have been increased greatly by the consideration shown tenants in recent land reform legislation. Naturally in such situations the value of land owning by noncultivators is greatly diminished. Should the present ceiling on holdings be reduced the prospects for outside invest-

ment in farm land would probably be fatally blighted. All that an interested observer can report is that there appears to be a very strong determination in the administration of the land reform program not to lower the ceiling on holdings.

The program as a whole has, however, already affected a considerable redistribution of income. Prior to the land reform program, the rents and value of land were at unprecedentedly high levels. The ceiling on rents of seven times the annual tax is estimated to have reduced the rent of tenants by 40 million pounds annually (£E = $2.87). For the few hundred thousand cultivators in the land reform villages the redistribution of income was even greater. In one village annual charges to the cultivator, including land purchase, were reported as 18 pounds per acre, about $50. This is a reduction of 60% from the rents before land reform. Similar reductions are reported generally. Although the problem of poverty remains, ubiquitous and unsolved, these efforts at social reconstruction have given a host of young men in Egypt hope that their situation can be improved.

India. In turning to India, as a great laboratory of social reconstruction, one finds a baffling array of land reforms. India is a democracy with a federal governmental structure and approximately a score of states, with powers and responsibilities comparable to those of our own states. Their judicial system and conception of due process are remarkably similar to our own as observed by such eminent jurists as Justices Warren and Douglas. In this system the primary responsibility for land legislation and reforms rests with the states although the ultimate power of the central government in this field has not yet been clearly defined. However, much of the intellectual leadership in land reform planning and promotion has been assumed by the India Planning Commission where a group of devoted experts are engaged in the analysis of land reform legislation and achievements. The Planning Commission group has also given strong moral support, at least, to the promotion of cooperative farming. In consequence of these multiple interests and administrative arrangements, virtually everything known to man about land reform has surely been considered and those ideas compatible with their philosophy of government have probably been tried somewhere in India.

Basically this diversity of approach is an expression of the democratic processes at work in social reconstruction, as Chester Bowles emphasizes so eloquently. The variety of efforts at land reform and even the lack of such efforts, are partly a reflection of the latitude accorded individual states in the federal structure of India. Within each state also there may be very great variety in the kind of tenure problems as a consequence of both the relative emphasis in policy on the type of tenure, such as ryotwari vs zamindari described below, and the accumulation over centuries of grants in privileges in rent receiving or tax immunity to persons as rewards for services or favors; the traditional form of "patronage," so to speak, in societies where land is both the principal form of wealth and the hall mark of status.

The land reform problem in India is widely recognized as a moral issue and this emphasis is particularly strong in the Bhoodan movement for land gifts under the leadership of Shri Vinoba Bhave, widely regarded as the spiritual successor to Mahatma Gandhi. During the first two years of the program, 1952 to 1954, some 2.4 millions of acres of land are

reported to have been donated to the cause.[4]

In comparing the background problems and grievances in India with those in other countries toward which recent land reform programs have been directed it is quite clear that there are significant differences, many of them favorable to the success of the Indian programs. Much of the feudalism of agricultural land holding in India had shallow roots and was of alien origin. The most notorious aspect of the feudal system in India was the zamindari holdings which grew out of the de facto conversion by the British East India Company of a tax collecting privilege into one kind of ownership of land. This ownership was rarely much more than a mere rent collecting interest with a part of the rent shared with the government in payment of the land revenue. Where the annual land revenue charges were fixed in perpetuity and were not raised, as in rather large areas in the lower Ganges plain, the holder of the zamindari interest in land had extensive and valuable privileges only slightly offset by the severely limited duties. During the past century or less, as the population has grown the claims to income from the steadily growing economic rent of land became more valuable and were frequently divided among many persons in complex forms of subinfeudation. The way for this zamindari system had been paved before British days by the form of local administration instituted by the Mogul rulers.

In respect to the alien origin of feudal interests there were similarities in India to the situation in Egypt. Many of the great landlords of Egypt in recent times were of alien descent including King Farouk. But this stands in marked contrast to most of the other countries of the Middle East. There large holdings of land have accrued typically to the leaders of the tribes, the sheiks. In these latter areas the gradual achievement of general public order and the market orientation of agriculture were roughly coincident with the more extensive settling of the tribes into some degree of fixed settlement with cultivation of land. Under these conditions the leaders of the tribes frequently became big landlords in which property and prerogative were not clearly distinguished. It is out of such extremely complex circumstances that the large landlords of Middle Eastern countries such as Iraq, Iran and Syria have achieved their present status. The acquisition of large holdings of land was also accentuated by the public land policies with easy and vague terms of "homesteading." Although pre-partition India was not without the accumulation of large holdings of land through the equivalent of sheikdoms, this was never a dominating circumstance and West Pakistan inherited most of this type of feudal interests. Compared to the status of a sheik who is both head of a tribe and proprietor of lands the zamindari holders in India would seem to have had a really tenuous status.

The original base upon which all of this paraphernalia of local administration, taxation and zamindari holding had been imposed, was the Indian village, evidently a wide array of rather self sufficient economies. The golden age of Indian rural life, therefore, was this village way of life. This great fact of Indian history not only gave a moral and patriotic basis for the campaign against the zamindari interests in land but also serves as a rallying point in the current programs of rural development which center in Indian villages.

[4] G. D. Patel, *The Indian Land Problem and Legislation* (Bombay, India: Raman, 1954), p. 220. It is reported from other sources, however, that much of this land is of doubtful value or with uncertain titles.

It should be noted, also, that this zamindari type of feudal system did not cover the whole of India. In the southern part of India, roughly the latitude of Bombay to Madras and southward, the predominant pattern of land holding in recent centuries has been the ryotwari tenure with the peasant (ryot) or other owner holding a title quite similar to our fee-simple ownership. In these areas a very great deal of tenancy developed as a part of the familiar process of the market orientation of agriculture in which land which is valuable and negotiable gradually accrues to non-cultivating owners, largely through foreclosure for debts.

With the achievement of independence a few years ago the state governments of India in varying degree intensified the campaigns for land reform which had been begun during the latter days of British rule. The zamindari abolition program in Uttar Pradesh, for example, was made effective July 1, 1952. On this day Uttar Pradesh state took title to six million farms with compensation to the former holders of zamindari interests in land graduated inversely according to the value of the zamindari interest. This transition was greatly facilitated by earlier legislation which had given tenants quite secure occupancy rights. Bombay state and the Punjab were also pioneers in the efforts to assure tenants of secure occupancy. There has been also a continued effort to reduce by legislation the landlord's share of the rent to one-third or one-fourth or less.

The land reform movements in India, especially those directed to the acquisition by the states of the zamindari type of interest in land were delayed for some years by litigation over the taking of property according to due process of law. The Indian constitution is not as specific on this point as is our own. But there were defensible claims that the proposed acquisition of landlord (zamindari) interest was confiscatory. One aspect of the question was that the high rents and low standard of living of the cultivators tend to give land a price which cannot be repaid from the current incomes of cultivators purchasing the land. This is a general problem which all public land acquisition and distribution programs encounter in dealing with developed lands in these old societies. The issues of compensation for acquired interests in lands in India, in Uttar Pradesh state for example, were further complicated by an intention to more fully compensate the holders of small zamindari estates than the larger holders. It had been proposed to pay a gradually reduced proportion of the value of their interests to the larger zamindaris. The proponents of the plan for graduated payments held both that cultivators and the state could not meet the financial burden of paying the previous full market value of the rent-receiving interest and that such full payments would actually be paying for the capitalized value of long standing injustices. The issue was finally resolved in Uttar Pradesh by making the compensation a combination of a low uniform rate of payment to all zamindaris with rehabilitation grants graduated in favor of the small holders. Such details may serve to illustrate the kinds of issues which constitutional reform encountered in India and which were resolved as a precondition to land reforms even though such reforms had long been a part of the Congress party policy under the slogan of "land to the tiller."

Japan. The postwar land reform program of Japan stands in rather sharp contrast to the movement in India in several respects. Although there had been a considerable tenancy agitation movement in Japan for several decades neither tenancy improvement nor tenant

purchases of land made much headway. The military occupation helped shape the indigenous land reform ideas into a workable program and General MacArthur put the full power and prestige of his administration behind this program. During this operation the ownership of most of the rented land in Japan was transferred to the actual cultivators through government purchase and resale within the very short time of less than three years. In 1944, 28% of all farmers in Japan were tenants and another 40% rented some land. Altogether 47% of the cultivated lands were operated by tenants. By 1951 only 11% of the land was under tenant cultivation, and only 5% of all cultivators were tenants, devoid of the ownership of any land.[5]

The actual procedure of land acquisition and distribution including the delicate and controversial determination of who was entitled to land was carried out by national, prefectural and especially by local land commissions. Each local commission was composed of five tenants, two owner-cultivators and three landlords. It is generally agreed that these commissions were of tremendous educational value, particularly to the tenants who up to that time had enjoyed only a very inferior social status in rural Japan.

The land was sold to the cultivators at a price fixed basically in terms of prewar prices and rents. Due to the very great inflation in the late 1940's the cost of the land to the cultivators was actually almost nominal. This resulted in an even more drastic redistribution of wealth than the design of the program had projected. Resident landlords on the main island were permitted to retain two and one-half acres of land; the small compensation for confiscated lands no doubt reduced many of them to being self-cultivators. From the viewpoint of justice the nominal compensation for land was unfortunate. But the quick retirement of debts by the cultivators did mean that the land reform program was an accomplished fact during the military occupation. Consequently any possible uncertainty of a long period of litigation by the deprived landlords was effectively foreclosed.

Since this land reform program was comprehensive and quickly done it will likely long remain something of a classical experiment in social reform. Furthermore, only time will tell precisely what was accomplished. The size of operating farm units was virtually unaffected and remains at something like two acres on the average. Current studies indicate clearly that the efficiency of farm operations has continued to increase. This is impressive in view of the already high level of output per acre of Japanese agriculture. The land reform program in Japan was greatly simplified by the near absence of a class of landless agricultural laborers. The surplus farm labor finds employment elsewhere. This is greatly facilitated by the networks of transportation which cover Japan. People can go to jobs. Consequently, the actual tillers of the soil in Japan were at least tenants, prior to reform; by contrast, something like a fifth of the village population in India are landless laborers mostly without genuine economic opportunities in farming by any standard, or under any system of tenure. The Japanese land reform was intended to put an economic base under a more democratic type of government. This it seems to have accomplished, at least the reform program

[5] For background analysis see Keiki Owada, "Land Reform in Japan," and comment by Wolf Ladejinsky, *Land Tenure, Proceedings of the International Conference on Land Tenure and Related Problems* (Madison, Wisconsin: University of Wisconsin Press, 1956) pp. 219-229. Current information principally from *Present Condition of Agricultural Cooperative Finance in Japan* (Tokyo, Japan: Central Cooperative Bank, 1956).

blunted the appeal to the peasants of the communist line.

Even though the present predominance of owner cultivatorship should prevail for generations, this decade will surely be something of a "golden age" of owner cultivatorship when seen from the perspective of future generations. For once almost all the farmers of Japan can enjoy the status of virtually debt-free ownership, regardless of age, inheritance, skill in financial management, or efficiency in operation. Gradually the life processes, the accidents of birth, and the ordeals and failures of life will surely erode away the present status and security of many of the peasant families. But for the present, tenant families who may have been without land for generations find themselves in the position of having the incomes of both tenant and landlord, of both land and labor.

The peasants are saving. A recent estimate by the Central Cooperative Bank put the annual cash surplus per farm household at 44,000 yen ($125) per year from 1952 to 1955. Approximately 60% of these savings are made through the cooperative system. This accumulation is facilitated by an arrangement whereby the government pays the individual peasant for his (compulsory) quota of rice by advances and deposits to his account in the cooperative.

Since ordinary deposits pay 2% and time deposits 5%, peasants have strong incentives to leave the funds on deposit. It is a simple yet ingenious arrangement to stimulate institutional savings, by cultivators, with the consequent pooling of savings for possible use in investments. Some such arrangement for savings and individual capital accumulation is essential if owner cultivatorship is to persist over the generations without being tied exclusively to family inheritance practices.

The mere mention of such items as payments of interest to peasants for savings on deposit, or of surplus farm labor finding off-farm employment, is itself recognition of the fact that Japan has a developed economy. This, in turn, puts the land reform program in a quite different social and economic context than in most of the other Asian countries. The changes in the economic and social status of peasants in Japan through land reform are remarkably similar to that experienced by European peasants in earlier eras and over longer periods of time as Europe industrialized. The social and political remnants of feudalism are notoriously persistent and it would be claiming too much for the recent land reforms in Japan to imagine that all these have been erased from rural life.

These brief comments on the land reform programs in a few countries are intended to relate somewhat specifically what is being done in our time in the name of land reform in countries taking the lead in such programs. It is, of course, a most sketchy account. Of the four countries singled out for special comment, Japan has experienced the most thoroughgoing transformation of her agrarian structure, to use the terminology adopted by the United Nations in the excellent report on land reform (1951). The reforms in the establishment of owner cultivators in Formosa, however, are probably even more thoroughgoing than in Japan.

Anything like an adequate account of land reform in Asia, would necessarily give considerable attention also to the Philippines. Here they have undertaken an extensive public program for promoting, defining and regularizing tenants' rights, as tenants, with a special branch of the industrial courts devoted to hearing landlord-tenant complaints. But

on the whole the efforts to strengthen tenant rights seem not to be prospering in Asia. The administrative machinery is inadequate and the political arrangements too far from an effective equality of citizenship. The drift in India in the last few years seems to be clearly away from reliance on improving security of occupancy for tenants, at least this is true in Bombay state which was a pioneer in improving the status of tenants. Only last year Bombay adopted a law which makes virtually all tenancies illegal.

Neither has it seemed feasible to include accounts of the land reform programs in Latin America or of the land problems in Africa. Bolivia has only recently undergone a genuine revolution on the land, with the distribution of land to the peasants under social and political circumstances reminiscent of the Mexican Revolution a generation earlier. In the main, however, the so-called land reform programs of Latin America are land development schemes somewhat like the Italian land reform program, as noted earlier.

In Africa the land tenure problem is an integral part of the pressure of economic change upon the tribal and community life, especially the growth in population and the commercialization of agriculture.

III.

The land reform programs of our time, drastic though they are to the victims who lose property and status, are from a broader perspective only the surface manifestation of the transformation of the very foundations of the economic order. It is through the perception of this fact that patriotic and enlightened landlords in many countries are supporting land reform programs. Also, the needs of the new nations of the world for independent economic and military strength are powerful incentives for economic development. This in turn leads toward land reform for no nation can be strong in these times where 60 to 75% of her people are poverty-ridden peasants. In this context also may be found the explanation for the widespread support given land reform programs by the military.

As one probes beneath the surface of all such activities, it is suggested that there are at least three great currents of change carrying the societies of the underdeveloped areas in the direction of reform in the pattern of land holdings; one is the changing status of investment in land; another is the pressure for equalization, for redistribution, of income; and a third is the economic consequences of the extension of popular franchise to old societies plagued with poverty. All three changes are closely interrelated and react one upon the other. In varying degrees they are found throughout the old world although their operations are more clearly evident in the democracies than elsewhere. There the struggles to create new societies are out in the open.

The recent economic trend of the ownership of land in Asia was succinctly summarized by a distinguished Punjabi civil servant: "Investment in land in the manner of the nineteenth century is dying out." By this he meant that persons were no longer interested in developing new lands—and more. The holding of land as an investment and a source of current income is losing its appeal. A part of this comes from the harassment of land owners over the level of rents and by the rising demands of peasants as well as by a new stigma being attached to being a landlord in these revolutionary times. Even a novice can readily muster quite an array of epithets to use against landlords not only from Marxian literature but also from Henry George and Ricardo among others. But more deeply, the loss of interest in land owning is

stimulated by the change in the relative returns on investment which occur with economic development. It is a fact, and one not lost on land owners in the provinces in Iran, for example, that the big money in land is now to be made from capital gains on land near Teheran and other growing cities. Furthermore, the possibilities of making great fortunes in an economically developed economy are much better in industry, trade and finance than in rural land holding; and this fact is widely known.

It is of some importance, however, that the criticisms of land holding run in personal terms and are directed against landlords rather than investment in land. It seems to be a common belief in Asia that landlords do little or nothing for the rent they receive. Certainly there are glaring examples, in almost countless number, where this occurs. Another consideration which weakens the "investment" status of landlords in Asia is the historical circumstance that many of the large holdings have accrued to families through influence, foreclosure or similar means which required little cash outlay. These facts are known and bitterly remembered. Yet in fairness to the landlords it must be recognized that most of whatever technological progress has come in agriculture in the economically backward areas, until very recent years at least, must be credited to the landlords. Conversely, however, wherever agricultural practices are genuinely stagnant this is prima facie evidence that creative management is not at work. Put more generally, in a traditional way of farming, the practices become routine and the talent for creative management withers away and is lost. Investment in farm land under these conditions becomes a mere rent-collecting enterprise.

Whether or not rents are really earned, and the issue is not being argued here, is a much more important question in a densely settled old agrarian society than in a dynamic economy. The total income is so small that the distinction between the "haves" and "have nots" is obvious. Also the increase in population, which so characterizes the rice deltas of Asia, automatically increases land rents as peasants compete for land. Such increases are so "natural" that effective rent regulation is virtually impossible.

When popular opinion becomes effective in influencing the directions of public policy, especially where people vote, the share of the crop going as rent becomes a political issue. The "natural laws" of economics under conditions of population pressure on the land are for rents to rise as Ricardo observed a century and a half ago. But the political requirement of public order and the welfare state is forcing Asian nations to try to stand Ricardo on his head, so to speak, through reducing land rents as population increases to protect the standard of living —meaning survival—of the cultivators. The politics of such situations pushes nations toward land reform; the economics pushes them toward land reform that allots the ownership of land to the cultivators so that they may have the incomes attributable to both land and labor. This would mean that the former land owner would be deprived of rental income. Where land redistribution touches only large-scale owners, as in Egypt, this can be explained away as curtailing conspicuous consumption. But where the owners of land are small investors, as in much of India, the rental income from land has been used as security and supplemental income for a whole host of "white collared" workers and as endowment for intellectuals. Social equilibrium on an issue such as this is reached only by long grinding ordeals. Already it has led to legislative stalemate

over land reform measures. Yet the handwriting would seem to be on the wall so far as an enduring rental income for absentee-owned land is concerned for much of Asia.

Where all this will lead to is impossible to predict. Surely some kind of land reform, some change in the status of cultivators, was virtually inevitable in this century as planned economic development pushed into the feudal-laden old societies. In the vast domains of communism the old order of rural life has been torn away but the peasants remain peasants unconvinced. In Jugoslavia, at at least, individual proprietorship is coming back. Outside the empires of communism, the land reforms are mostly piecemeal, gradual, and characteristically include both compensation to former land owners and sales of the land to the peasants. One thing is clear, fundamental readjustments are under way. The leaders of the land reform movements in the free world are groping their way toward a social and economic organization which is consistent with the western view that the dignity and freedom of man are creative and productive.

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Theory of Urban Land Values

By PAUL F. WENDT*

RECENT YEARS have witnessed a re-awakening of interest in urban property values as cities face the problems of decentralization, obsolescence, and new fiscal crises. Important decisions in urban zoning, master planning, redevelopment, transportation, and parking require assumptions concerning the long-term trends in commercial and residential property values and the effects of varying programs of public investment upon these trends.

Herbert B. Dorau has concluded recently that the big city is economically insolvent and physically obsolete and that a significant decline has occurred in the real values of urban land during the past quarter century.[1] Dorau identified the revolution in automotive transportation as the principal factor accounting for the decline in the "big city." The theoretical roots of Dorau's argument can be traced to the writings of land economists in the nineteen twenties. Haig argued explicitly that improvements in urban transportation would cause a decline in urban property values.

". . . . Obviously, an improvement in transportation, other things remaining the same, will mean a reduction in friction and, consequently, the diminution of the aggregate sum of site rentals . . . ."[2]

Ely advanced similar arguments concerning the influence of increased efficiency in both transportation methods and construction techniques, and this provided the basis for his law of the movement of urban land values: "Other things remaining equal, in a progressive society with increasing wealth and stationary population, land values will decline."[3] Dorau and Ratcliff argued in the same vein, maintaining that increasing the speed and decreasing the cost of transportation would increase the supply of urban sites and thus bring about a decline in site rentals and urban land values.[4]

The theoretical structure upon which these hypotheses are based has had a broad and continuing acceptance in urban land economics and is of fundamental importance in considering the future of urban land values. The primary objective of the present article is to examine critically the hypotheses of Haig, Ely, Dorau, and Ratcliff concerning urban land values and technological change to determine whether they provide a useful framework for considering the future of urban land values, require important modification, or should be rejected entirely.

It will be argued that their conclusions are based upon a highly theoretical and oversimplified application of classical price and rent theory to urban land markets; that their acceptance requires unrealistic and unstated assumptions; that they fail to consider the dynamics of demand influences; and that they have little or no applicability to present-day urban land value trends.

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[1] "Urbanism and the Future of Land Values," *The Appraisal Journal*, January 1949, pp. 15-24.

[2] Robert Murray Haig, *Regional Survey of New York and Its Environs*, Vol. I (New York: Regional Plan of New York and Its Environs, 1927), p. 39.

[3] Richard T. Ely and Edward W. Morehouse, *Elements of Land Economics* (New York: The Macmillan Co., 1924), p. 262.

[4] H. B. Dorau and Albert G. Hinman, *Urban Land Economics* (New York: The Macmillan Co., 1928), pp. 509-11; Richard U. Ratcliff, *Urban Land Economics* (New York: McGraw-Hill Publishing Co., 1949), p. 372.

The development of the author's argument will require four major steps: *First*, a consideration of the problems of imputation and estimation involved in land value determination as a basis for understanding the nature of the land valuation process; *second*, a review of the important writings on the theory of urban land value, which will serve to show the historical evolution of the theories under examination; *third*, a synthesis of urban land value theories in a theoretical model representing the various factors impinging upon urban land values; and *fourth*, the employment of this theoretical model as a basis for a critical analysis of the Haig-Ely-Dorau-Ratcliff hypotheses concerning the influence of improvements in transportation and changes in construction costs and efficiency upon urban land values.

Problems in Land Value Determination

It is generally agreed that the value of urban land results from the discounting of future net incomes attributable to urban land by virtue of its location.[5]

Although the theory of urban land values can be simply stated, it is more difficult to apply since urban sites do not yield incomes except in combination with applications of labor, capital, and entrepreneural services. Since the returns from urban land are thus seen as joint returns, the estimation of the future net incomes attributable to an urban site involves a problem of *imputation* as well as *estimation*. Taussig pointed out that urban land rent arises because labor and capital applied on some sites yield unusually large returns and the owners are thus able to "keep for themselves the excess of return over and above what is usually got."[6]

The literature of neo-classical economics recognized that the yield on the advantageous urban sites depends on the skill and foresight of innovators.[7] Thus, a successful new office building or a shopping center will bring a gain first to the promoters and innovators, but it will gradually be reflected in a rising price for the site and for neighboring sites adaptable for the same use.

> "The parcel of 'improved' realty—land and building as one complex—earns an amount determined solely by its serviceability for business or dwelling uses. It is only in the very long run that a difference becomes apparent between rent and interest—between that return which goes to the owner of the site as such and that which goes to the owner of the capital put on it. As time goes on buildings do wear out, old ones are torn down, and new ones are substituted in their place in order to put the land in its most profitable use. Landowners then secure the full differential gain which their site is capable of affording."[8]

Taussig's analysis emphasizes the difficulties in the short-run determination of the net incomes which are imputable to urban land as contrasted with the building investment or entrepreneural profits. Ratcliff maintains that it is impractical to determine the fractions of real estate income which are imputable to land and building separately for an improved site.[9] Appraisal theorists are in general agreement, however, that land value may be estimated by assigning a portion of the total returns from land and building in combination to the amortization of an assumed building investment and capitalizing the remainder to secure land value. This technique is only acceptable, however, when the site is used

[5] Richard M. Hurd, *Principles of City Land Values* (New York: The Record and Guide, 1903), p. 2. Ely and Morehouse, *op. cit.*, p. 242.

[6] F. W. Taussig, *Principles of Economics*, Vol. II (4th ed.; New York: The Macmillan Co., 1947), p. 125.

[7] Alfred Marshall, *Principles of Economics* (8th ed.; London: The Macmillan Co., 1925), Chapter 11.

[8] Taussig, *op. cit.*, p. 128.

[9] "Net Income Can't Be Split," *The Appraisal Journal* April 1950, p. 168.

for its best economic or "highest and best" use.[10]

The latter concept, central to the valuation of urban land, is an application of the economic principles of proportionality and competition of uses. Businessmen, in deciding upon locations and the type of improvements to be placed on urban sites, will decide upon a building which maximizes the net returns to the site after allowing for a return on and amortization of the investment in improvements. The techniques through which decisions are reached require the comparison of estimated total returns on a series of hypothetical alternative types of structures. Ely and Wehrwein illustrate the investment calculations involved in deciding upon the ideal height of an office building.[11] Theoretically, competition for use of sites, using this type of analysis, should result in the adaptation of each site to its highest and best use and the returns to land under this use are capitalized to determine land value. This land residual method of land valuation, as it is called, assumes that building returns are fixed and any residual or excess returns accrue to the land.[12] The assumption implicit in the use of this method, that land is adapted to its highest and best use excludes its application in many cases in which buildings are obsolete or otherwise poorly adapted to a site.

Although short-run imputation of net returns to land presents a difficult problen, competition in the market for the use of advantageous sites should result in the differential advantages of each site being reflected in its rental and value in the long run.[13]

The foregoing discussion emphasizes that future prospects are the principal factors influencing current urban land values since it is the right to receive future income which is transferred in the real estate market. Hoyt, in his study of Chicago land values, pointed up the speculative errors which frequently occur in the market estimation of future incomes from urban land as investors are influenced by successive waves of over-optimism and conservatism regarding the future growth and property incomes in a large city.[14] The importance of the element of psychology as an influence upon urban land values was also emphasized by Unwin:

". . . . What is bought and sold in the market is merely the chance to benefit by a hoped for value, if it is ever realized. The value is of the same nature as the increase in salary which a clerk hopes to receive next year, and on which he may raise a loan if he can find anyone who fully shares his optimism."[15]

The great land booms of history bear testimony to the fact that today's values are based upon expectations of the future. Writing on "Trends in Urban Real Estate Values, Past and Future," in 1930, Stanley McMichael said, "I am not a prophet, nor the son of a prophet, and can only speculate, as the reader may, on what the future holds in store."[16]

It can be seen that problems of *imputation* and *estimation* raise formidable obstacles to the development of "perfect" market systems for urban land and

[10] Paul F. Wendt, *Real Estate Appraisal* (New York: Henry Holt & Co., 1956), pp. 172-78.

[11] Richard T. Ely and George S. Wehrwein, *Land Economics* (New York: The Macmillan Co., 1940), pp. 127-28. A similar analysis is found in Alfred Marshall, *Principles of Economics* (8th ed.; London: The Macmillan Co.) pp. 448-49.

[12] *Ibid.*

[13] Walter Isard, *Location and Space-Economy* (Published jointly by The Technology Press of Massachusetts Institute of Technology and John Wiley & Sons, Inc., New York, 1956), pp. 202-04.

[14] Homer Hoyt, *One Hundred Years of Land Values in Chicago* (Chicago: The University of Chicago Press, 1933), pp. 456-57.

[15] Sir Raymond Unwin, "Land Values in Relation to Planning and Housing in the United States," *Land Economics*, August 1951, p. 282. (Reprinted from *Land Economics*, February 1941.)

[16] *The Annals*, March 1930, p. 173.

the assembly of empirical data as a basis for an adequate theory. It is quite understandable, therefore, that the urban land economist turns to the market for urban land value data, since it is here that "the minds of most men meet." It is fundamental to the discussion that follows, however, to recognize that the market values of urban sites result from the process of discounting expected future returns assignable to urban land.

Review of Urban Land Value Theories

The theory of urban land values is a curious mixture of broad generalizations concerning the future of urban land values, applications of classical rent theory to hypothetical isolated communities under assumed conditions, and classification of multiple demand and supply influences affecting urban land values. Economists are in general agreement that it is the formation of people into communities which gives rise to the utility and scarcity of urban land and hence to its value. The emphasis upon location as the basis for urban land values had its roots in the work of von Thünen who traced the variations in agricultural land rents to differences in fertility and location in a theoretically isolated community.[17] Marshall referred to the locational advantages of urban land as contributing "situation value."[18] Chamberlain states that, "the rent of urban land is explained wholly, that of agricultural land partly, by the factor of location."[19]

Haig endeavored to sharpen the analysis of the influence of location upon land value by consideration of the relative accessibility advantages of different urban sites. In making his argument Haig assumed an isolated city in which accessibility to the central core was the dominant aim. He also assumed that the primary objective of individuals and businesses in making locational decisions was to reduce the sum of site rentals and transportation costs (which he referred to as the costs of friction) to a minimum.

Haig's analysis can be summarized as follows. The center of the city has the advantages of physical proximity or accessibility to all parts of the city. All activities will find the center the most convenient point for location and rents in that sector will therefore be the highest. Competition of uses will result in excluding certain uses which place a lower rental value upon central location. The owners of the relatively accessible sites will impose a rental charge equal to the saving in transportation costs which the use of their sites makes possible.[20] Haig continued his analysis by pointing out that general improvements in transportation or specific developments which made it easier or cheaper to get to or from the center of the city would decrease the relative accessibility advantages of central sites and hence reduce total urban site rents and values. Conversely, reduced accessibility from outlying areas would force businesses and individuals to move in closer to the center and tend to raise site rents and values. Pursuing his analysis further, Haig argued that in the best planned city the aggregate site rents are less or the transportation system is superior—or both.[21] This argument is consistent with his view that the best criterion for city planning is minimizing

[17] Johann Heinrich von Thunen, *Der Isolierte Staat in Beziehung auf Landwirtschaft und Nationalokonomie* (3rd ed.; Berlin: Schumacher-Zarchlin, 1875); Arthur H. Leigh, "Von Thunen's Theory of Distribution and the Advent of Marginal Analysis," *Journal of Political Economy*, 1946, pp. 481-502.

[18] Alfred Marshall, *Principles of Economics* (8th ed.; London: The Macmillan Co., 1925), p. 441.

[19] Edward Chamberlin, *The Theory of Monopolistic Competition*, Harvard Economic Studies 38 (Cambridge: Harvard University Press, 1933), p. 200.

[20] Robert Murray Haig, *Regional Survey of New York and Its Environs, Major Economic Factors in Metropolitan Growth and Arrangement*, Vol. I (New York: Regional Plan of New York and Its Environs, 1927), pp. 38-40.

[21] *Ibid.*

transportation costs and that this in turn results in lowering land values.

Haig's analytical framework and conclusions have been accepted by virtually all land economists. Ely and Wehrwein state:

"Costless transportation would do away with situs; there would be no "centers" and no advantage of location manifesting itself in high values. In fact, the 'peak' of land values would disappear. This, however, would not apply where space did not permit all to enjoy equal advantage."

It is evident that Ely and Wehrwein recognized that costless transportation is a highly abstract concept and that some advantages of location would persist under almost any transportation conditions.

Dorau and Hinman, former students and research associates of Richard T. Ely, classified the factors influencing the value of urban land into three groups; (a) factors affecting income, (b) factors affecting the rate of capitalization, and (c) factors affecting the direct satisfaction from land ownership. The first of these, land income, according to their analysis, is influenced by the demand and supply for the services rendered by urban land. Although they follow Marshall, Ely, and others in regarding population and incomes as the underlying influences responsible for rising rents and land values, they emphasized that the relationship between land values and population is not so direct and immediate as commonly assumed.

Four considerations are cited by Dorau and Hinman as influencing the supply of urban sites: (1) physiographic layout of area, (2) speed and cost of transportation and availability of other municipal services, (3) zoning, taxation and other forms of public control, and (4) cost of production.[22] In general their analysis pointed up the manner in which each of the above factors affected the area adaptable for urban utilization and hence the market supply of land. Citing numerous influences affecting the supply of urban sites, they concluded:

"The wider the area whose physiographic layout is well adapted to urban utilization, the greater will be the number of sites competing for this use, and, all other factors being taken for granted, the less will be the value of any particular site . . . . Increasing the speed and decreasing the cost of transportation increase the supply of urban sites by bringing more of them into possible economic utilization . . . . Let the city's boundaries be extended . . . . and the supply of urban sites is thereby increased. Zoning, taxation and other forms of public control may have a similar effect."[23]

It is important to note that the authors do not state that increased areas of individual cities as a result of physiography, transportation, zoning, or other influences will reduce *total* urban land values. In addition, the statement implies that the authors recognized that any depressing effect upon site values of an increased supply of urban land may be offset by an expansion in demand. The authors also seem to recognize that improvements in transportation add to the accessibility advantages and to the value of certain urban sites:

"People doing business and people employed in a district must be able to come to it and depart from it in reasonable comfort and time. Slow, badly congested transportation facilities lead to the decentralization of central commercial districts and a resulting depression in land values."[24]

It is apparent from the above that any depressing effect of improved transportation by virtue of its influence upon the supplies of urban sites may be offset by the bolstering influence upon the values of sites in areas specifically affected. The

[22] Dorau and Hinman, *Urban Land Economics*, pp. 509-11.

[23] *Ibid.*, p. 511.

[24] *Ibid.*, p. 518.

latter conclusion is in effect a contradiction of Haig's analysis and their own earlier conclusions that a deterioration in transportation would increase site rents and values.

Turning to the rate of capitalization, Dorau and Hinman express the view that rates of capitalization will shift over time for real estate investments as changes occur in interest rates, expectations of risk, investment preference, and chance for capital gain, and that such shifts in capitalization rates will have a direct effect upon valuations resulting from the capitalization of expected future incomes.[25]

Ratcliff follows classical rent theory in holding that the value of urban land services derives in the major part from location and that the value differences among sites are a reflection of differential locational advantages. He argues that value is the capitalized expression of economic rent and that market prices of land will tend to reflect forecasts concerning its future productivity. The business calculations that determine urban land usage, he points out, are fundamentally similar to those employed in other fields of investment and the term "highest and best use" simply describes the type of land development program for a specific site which will justify the highest payment for land.[26]

Ratcliff quotes Haig in explaining the manner in which transportation costs affect site rents and values. At one point Ratcliff appears to recognize elements of potential error in Haig's broad generalizations concerning the adverse influence of general transportation improvements upon site rents and values. For example, after quoting Haig's analysis, Ratcliff makes the following qualification in a footnote: ". . . . Improvements in transportation which benefit only one area will, of course, result in higher rents in that area."[27] Haig had hypothesized a "magic carpet" type of transportation improvement in which it would be easier for everybody to go everywhere. Since transportation facilities always go from one place to another, it is difficult to understand how transportation improvements could avoid increasing the accessibility of these specific areas and hence site rents and values. As will be noted presently, this observation is the key to a major criticism of Haig's theory.

In another work, Ratcliff adopted and extended Haig's theoretical conclusions without appearing to recognize these and other important practical limitations.

> ". . . . when bus fares are raised, total land values tend to increase in the area served because the costs saved by convenience will be greater . . . . the spread in the use of the private automobile has, in fact, tended to reduce land values in central areas by making outlying retail centers more generally accessible. It further follows that the best planned city will have the lowest total land values."[28]

The assumptions which are implicit in Ratcliff's analysis and the acceptability of his broader generalizations will be discussed below.

Richard M. Hurd developed a comprehensive synthesis of the economic theory of urban land values with an empirical review of land value trends in the United States almost 50 years before Ratcliff's textbook in urban land economics and a quarter of a century before publication of the works of Haig, Ely, and Dorau which were cited earlier. Following Marshall, Hurd held that the value of urban land is the resultant of the capitalization of ground rents. He

[25] *Ibid.*, pp. 513-14.
[26] Richard U. Ratcliff, *Urban Land Economics*, (New York: McGraw-Hill Publishing Co., 1949), Chap. 12.
[27] *Ibid.*, p. 372.
[28] Robert Moore Fisher, ed. *The Metropolis in Modern Life* (Garden City, New York: Doubleday, 1955), p. 129.

agreed that economic rent for urban sites is based upon superiority of location. Estimated future prospects, according to his analysis, form the "mastering factor of all exchange values" and capitalization rates will tend to vary with the prospects for growth in different localities, being generally lower in larger cities where the ease of sale and stability of property income are generally greater. Hurd pointed out that urban land values are influenced to such a degree by general financial and economic conditions that values at times "represent simply a condition of the public mind."[29]

> "If business expands and population increases in a city, the sum total of land values is certain to increase . . . . If population and business become stationary the sum total of land values will decrease in proportion to the present discounting of future growth, subsequent movements consisting of redistribution of value, as one part of the city or another . . . . flourishes or declines."[30]

He assigned chief importance to increases in population and wealth, changes in transportation, and expansion of public facilities as causes of the redistribution of urban land values in a city.

Hurd appears to have recognized the complexity of the influence of transportation improvements upon urban land values in his discussion of the effects of street railroad development upon urban values:

> "Street railroads have wrought a revolution in the structure of cities, scattering population over a wide area, adding value to the circumference by rendering it accessible for residences, and to the center by concentrating traffic within it, a part of this added value being removed from the intermediate zone. By rendering new districts accessible, thus increasing the area of supply of land, the value of all competitive land is reduced, so that the effect of street railroads on residence land is to lower its average value."[31]

[29] Hurd, *op. cit.*, pp. 2 and 11.
[30] *Ibid.*, p. 156.
[31] *Ibid.*, p. 94-95.

Hurd's statement contrasts with the sweeping generalizations of Haig, Dorau, and Ratcliff. The influence of any specific transportation improvement will, according to his analysis, vary for different classes of property and for different sectors of the city. It is significant to note that he concludes that the effect of street railroads was to lower the *average* value of residence land and not necessarily to lower the *total* of urban land values in the cities affected. Edwin H. Spengler, investigating the effects of rapid transit upon land values in New York City, found that the building of subways in New York was accompanied by shifts in land values rather than any "supergrowth" in values in the whole city. He concluded that factors other than transit developments were largely responsible for the value trends noted.[32]

Swan concluded that communities with like purchasing powers of their populations will have approximately the same total land values regardless of a very substantial difference in their respective areas.[33] Swan's writing illustrates the confusion which exists in the literature in this field. In one place he held that the limitation of the developed area of a city would result in over-all economies in the costs of development and "to a degree at least . . . . in somewhat lower land values." Immediately following and apparently in contradiction, he holds that "In individual instances, however, such savings would no doubt help to swell the amount of the unearned increment" and that the value of individual parcels of land may be increased by the "capitalization of congestion."[34]

Swan's failure to recognize that the economic laws of proportionality apply to

[32] *Land Values in New York in Relation to Transit* (New York: Columbia University Press, 1930), pp. 129-31.
[33] Herbert S. Swan, "Land Values and City Growth," *Land Economics*, May 1934, 188-201.
[34] *Ibid.*, pp. 188-90.

land as well as to other resources accounts for much of the contradiction and confusion in his writing. As Ely and others had pointed out, the principles of diminishing returns and proportionality provide the realistic limit upon the "capitalization of congestion" and encourage the development of each site for its best economic use.

Theoretical Model of Urban Land Value Theory

Current urban land values represent the present value of the expected future net returns attributable to land. The foregoing review of urban land value theories has focussed attention upon the many factors influencing these expected future returns and their capitalization. As Hurd and others have pointed out, the structure of values within a city undergoes constant change as cities expand or decline and as the characteristics of districts change. It is important, therefore to distinguish between those factors which will affect the values of individual sites and those which will affect the aggregate of urban land values in a city. It has also been evident that specific factors may have varied affects upon the different classifications of urban land in a city.

Theoretically the aggregate of land values in a city may be represented as follows:

$$(1)\ V = \frac{\text{Average future expected aggregate net annual urban land rent}}{\text{Capitalization rate}}$$

The numerator of the above equation represents an estimated average residual net income to urban land after allowing for costs and can be represented as the difference between expected gross revenues to the property including improvements (R_x) and expected costs (C_x).

$$(2)\ V = \frac{R_x + C_x}{\text{capitalization rate}}$$

Revenues which are expected to accrue to urban property (R_x) may be shown as dependent upon investors' expectations ($_x$) as to population (P), the average amount of incomes spent for urban services (Y), the competitive pull of the urban area (P_u), the supply of competitive urban land (S) and the prospective investment in public improvements such as parking, street facilities, etc. (PI). Thus:

$$(3)\ R_x = f_x\ (P, Y, P_u, S, PI)$$

Similarly, cost expectations (C_x) in equation (2) can be represented as the sum of local property taxes (T) operating costs (O_c), interest on capital invested in present and future improvements, (i_{im}), and depreciation allowances on present and future improvements (D_{im}). Thus:

$$(4)\ C_x = \text{sum of}_x\ (T + O_c + i_{im} + D_{im})$$

The capitalization rate shown in equation (2) can be represented as dependent upon interest rates (i), allowances for expected risk (R) and expectations concerning capital gains (C_g). This represents a conceptual average rate for all urban properties, the individual rates varying with risk, location, etc. Thus:

$$(5)\ \text{Cap Rate} = f_x\ (i, R, C_g)$$

Equation (2) can thus be represented as follows:

$$(6)\ V = \left[\frac{f_x\ (P, Y, S, P_u, PI) - \sum_x (T + O_c + i_{im} + D_{im})}{f_x\ (i, R, C_g)}\right]$$

It will be observed that may of the elements in the equation are frequently not established independently by investors. For example, assessed values are based upon property value while local taxes reflect other factors as well and influence property value as an item of cost. Similarly, insurance costs are related to the value of property improvements and constitute an important item of expense.

Many factors influence the expectations of investors concerning future revenues and costs, among them the current trends in land values in the city. The risk factor in the determination of the capitalization rate (R) and expectations of capital gains are influenced by the degree of optimism shown in the revenue and cost estimates and by present values.

Critical Analysis of Haig-Ely-Dorau-Ratcliff Hypotheses

Equation (6) provides a frame of reference for further consideration of the hypotheses of Haig, Ely, Dorau, and Ratcliff concerning the influence of increased efficiency in transportation and in building construction techniques upon urban land values. In a nutshell, their argument is that improvements in transportation or in building technology have an adverse influence upon the total of urban land values through increasing the supply of land available for urban use.

Haig argues that a general improvement in transportation will reduce the relative locational advantages of central urban sites. As the relative advantages of a central location are reduced, business firms and individuals will redistribute activities, resulting in a decrease in the demand for central as compared with outlying locations.[35] Similarly, Ratcliff's conclusion that an increase in bus fares will raise urban land values rests on the assumption that indivudals and businesses will be willing to pay higher site rents because of the greater savings in transportation costs.

It is of some importance to consider the assumptions which are implicit in the Haig-Ratcliff analysis. First, referring to equation (6), it must be assumed that the population (P), incomes (Y) and the geographical area served (P_u), remain constant in order for an improvement in transportation to result in a decline in the aggregate of site rentals and values in a city. Thus Haig's rather sweeping generalizations apply only to an isolated stationary city where an improvement in transportation will not result in increasing the accessibility advantages of the urban area to additional population on the outskirts of the city. In giving exclusive attention to the incremental supply of competitive urban land—(S in equation (6)—Haig and his followers neglected to consider the influence of transportation improvements upon the demand for urban services.

It is also evident that Haig and Ratcliff failed to consider the differential effect of an increase in bus fares upon the various classes of property in a city. By reference to equation (6) it can be hypothesized with Hurd that the short-run effect of an increase in bus fares in an isolated city would be to cause a decline in travel to the central commercial area (a decline in the factor P_u) and hence a fall in commercial property values in the central business area. This might be paralleled by a decline in the values of residential land on the periphery of the city and a corresponding rise in residential values closer in as some commuters were induced to move in closer to the center; but, as will be noted presently, this is by no means certain in modern urban areas.

Ratcliff's conclusions as to the effect of the use of the auto upon land values in the central areas are both unsubstantiated and unconvincing. There is little evidence that the growing use of the private automobile has "tended to reduce site rents in central business locations by making outlying retail centers more generally accessible," as he claimed. Again, it can be argued that Ratcliff has neglected to consider that the use of the automobile has greatly expanded the

[35] Haig, *op. cit.*, p. 38.

total areas served by urban centers. The auto has not only made outlying areas more generally accessible but, by the same token, has made the central areas more accessible to larger populations and buying power.

The Haig-Ely-Dorau-Ratcliff theory of urban land values assumes that accessibility to the urban core is the prime factor influencing locational decisions in urban areas. Lampard and others have recently concluded that the evidence of economic history affirms the continuing vitality of localized concentrations of industry. He points out, however, that actual patterns of land use never approach the high order of rationality posed in Haig's conceptual scheme.[36] A recent study of the attitudes of commuters indicates that there is little or no relationship between the time expended in daily travel to work and the desirability of fringe area residence.[37] This study of residential preferences and other locational studies raise serious doubts concerning the central importance of transportation costs to the urban center per se in urban locational decisions. Individuals and businesses have wide choices concerning location in the complex and interrelated urban communities of today and many factors other than transportation costs to the urban center influence these decisions. The revolution in means of transportation and communication has completely altered the traditional spatial concepts of firms and individuals. Considerations of accessibility to an urban region or to a regional or even an international complex of urban areas have to some extent displaced the older concept of accessibility to the urban core.

These observations emphasize the important qualifications to any acceptance of Haig's theory of the relationship between transportation and urban land values as well as the dearth of empirical knowledge in the field. In the view of this author the assumptions underlying Haig's analysis are so far reaching as to preclude it having any practical significance. It is certain that the effects of improvements in transportation upon urban land values are considerably more complex than appears to be assumed in the Haig-Dorau-Ratcliff analysis. Improvements in transportation will probably tend to raise property values in the urban areas affected. Such increases may be offset in part or as a whole by the increments to the supply of accessible urban land resulting from the improvement. The exact effect in any given situation will depend upon the degree of substitutability among urban sites generally, the relative strength of the demand and supply forces released, and upon the financial costs of supporting the transportation improvements.

The seemingly highly significant conclusion reached by Haig and Ratcliff that the "best planned city" will have the lowest total of land values derives from their view that improvements in transportation are primary goals for city planners and will result in reducing land values. The rejection of the Haig-Dorau-Ratcliff analysis as to the effects of transportation improvements upon land values implicitly negates their conclusions with respect to the relationship

[36] Eric E. Lampard, "The History of Cities in the Economically Advanced Areas," *Economic Development and Cultural Change* (January 1955), 81-136.

[37] Walter T. Martin, *The Rural-Urban Fringe, A Study of Adjustment to Residence Location* (Eugene, Oregon; The University Press, 1953), p. 45. See also, Donald L. Foley, *The Suburbanization of Administrative Offices in the San Francisco Bay Area*, Research Report 10 (Berkeley: Real Estate Research Program, Bureau of Business and Economic Research, University of California, 1957), p. 26.

between land values and the "best planned city."[38]

Richard T. Ely argued that land values will decline with increased efficiency, since increasing the efficiency with which land is used would have the same effect as increasing the supply of urban sites. Based on this analysis, he formulated his law of the movement of land values which was cited above:"Other things remaining equal, in a progressive society with increasing wealth and stationary population, land values will decline." Ely defended the above hypothesis by contrasting the theoretical and actual effects of the development of structural steel and other technological improvements upon the supply of urban land and its values:

". . . . Normally we would expect this great increase in the available services of land to depress prices. This, however, is based upon the premise of a stationary or slowly growing population with a relatively small change in demand. As a matter of fact, the use of structural steel, electric and motor transportation, and other technical improvements made possible and supported a great concentration of population in cities."[39]

In attempting to defend his own hypothesis, Ely put his finger on the weakness brought out above in the Haig-Ratcliff conclusions regarding the influence of improvements in transportation upon land values. Ely's law, however, is grounded in classical rent theory. According to this theory an improvement in building techniques would increase the total capacity of urban land to provide services. Marginal land, or that land bordering on the business district, would no longer be needed for office building use with the assumed improvement in building techniques. Assuming a stationary society with no change in demand, the rent and hence the values of this land would decline. Since classical rent theory assumes that the rent of centrally located sites is calculated as a differential compared with marginal or no rent land, Ely assumed that rents in the central area would also decline with a consequent drop in total land values.

A modified conclusion could result from a different view of the degree of substitutability among urban sites and of urban site rent. Capital goods and land derive their value from the utilities which they furnish and it can be argued that the income-yielding power of each building site would derive from the highly differentiated urban services provided.[40] In this sense, urban sites are in some respects noncompeting price groups and the rent of centrally located sites would not be calculated as a differential return in comparison with cites outside of the central business district. Rental price structures and performance under these assumptions might be expected to resemble those found in the pricing of specialized professional services. A technological improvement which permitted construction of taller buildings might have a market effect similar to that which could result from a technological development permitting surgeons to perform more operations per day. Although theoretically the "supply" of surgeons' services has been increased, surgeons' incomes would not be expected to decline. Doctors might pass on to their patients some

[38] The naive reader may be led to a nonsense conclusion by a separate reading of Ratcliff's discussion of highest and best use (*Urban Land Economics*, p. 356) and the above comments on the best planned city (*The Metropolis in Modern Life*, p. 129). In the first discussion, he refers to highest and best use as that use which will justify the *highest* land values. In the latter reference he says that the best planned city will have the *lowest* land values. It could be inferred, therefore, that the best planned city would be one in which land generally was not used for its highest and best use. The solution to this apparent dilemma, of course, is that Ratcliff implied that land would be used for its highest and best use under all conditions, but that with improved transportation the general level of values would be lower.

[39] Ely and Morehouse, *op. cit.*, p. 262.

[40] F. W. Taussig, *Principles of Economics*, Vol. II (New York: The Macmillan Co., 1947), pp. 153-54.

of the reduction in costs, but it would appear almost certain that they would not pass on the entire benefit of the time saving development in lower fees.

The above analogy rests on the view that the principles of monopolistic rather than competitive pricing operate in the urban land market. Although the potential supply of land adaptable for urban use is large, the owners of urban sites have a monopoly of the product of each individual site. This view is in accord with Chamberlin, who argued that urban site rent is a monopoly return and quite different from agricultural rent:

> "The movements of buyers being impeded, the product of each site contains an element of convenience to a certain group, and the seller locating on the site has a monopoly of its product, the full value of which he is obliged by the competition of others for its use to pay into the hands of the landlord . . . . Two sites have different rents to the degree that they are in different markets, and to exactly this same degree the concept of an extensive margin is meaningless as applied to them."[41]

A review of the influence of improved building technology upon urban site rents and values conceived in the above manner yields different conclusions from those reached by Ely and others. A technical improvement in building would add to the accessibility advantages of centrally located sites by increasing the potential densities in large structures and in central areas and thus might be accompanied by an increase in the demand for such sites, even in Ely's assumed stationary economy. This increase in accessibility advantages and demand would be capitalized upon by the landlord in higher site rentals, depending on the price elasticities of the relevant supply and demand schedules and the degree of shifts. Any resultant increase in site rentals might offset in whole or in part the decrease in site rentals and values for potentially competitive space on the fringe, which would no longer be needed as a result of the hypothesized technical improvements. Improved building technology even in a stationary state, therefore, need not result in decline in total urban site values, since decreases in site values on the periphery of the business area might be offset by increases in the central area.

This analysis suggests that the influence of increments to the supply of urban land, whether they result from changes in transportation or building techniques, is considerably more complex than is assumed by Ely, Haig, and others, since there are an infinite number of submarkets of the urban site market as a whole, each with distinctive demand and supply schedules. Unfortunately, we know little or nothing about the price elasticities of demand and supply schedules for urban sites. It appears, however, that the assumptions of purely competitive price behavior which are implicit in the theories of Haig, Ely, and Dorau are highly unrealistic and that Ely's law of the movement of land values is of little or no use to the analyst seeking to interpret past or future trends in urban land values.

It is of related interest to consider the influence upon urban land values of changing building costs under dynamic conditions. It can be noted from equation (6) that a decline in building costs with no change in revenues to urban land would increase net urban land incomes and values. Competition among owners of centrally located sites would probably result in a portion at least of the benefits of lower costs being passed on to investors or consumers in lower rents. An increase in building costs during an inflationary period has a dual effect; increasing revenues through incomes (Y)

[41] Chamberlin, *op. cit.*, Appendix D, pp. 267-68.

and increasing operating costs (O_e) and depreciation allowances on building improvements (D_{im}). It can be seen, therefore, that it is necessary to distinguish between the effect of building cost changes which are accompanied by offsetting revenue changes and those which are not. Rising building costs, not offset by increases in revenues, will result in declining urban land values in the short run, while falling costs should have the opposite effect. The effect of rising building costs upon land values may be obscured in the short run, however, by increasing prices for improved sites. The rise in value of such sites, however, is in reality an increase in the value of the improvements, rather than in the land. In the long run, as Taussig's analysis cited above points out, increased building costs will be shifted to investors and consumers and the land owners should "secure the full differential return which their site is capable of affording."

Conclusions

Urban land value theories range from unsubstantiated hypotheses concerning relationships between population growth and land value trends to trite theoretical formulations based upon unrealistic assumptions or conditions. Much of the current urban land value theory stems from the work of Ely, Haig, and Dorau in the nineteen twenties. Examination of these earlier writings reveals serious shortcomings in their attempts to apply traditional price and rent theory to urban site valuation problems. Important assumptions with regard to demand influences are seldom made explicit in the literature. Since the urban land market is divisible into many virtually non-competing submarkets, the rents paid for centrally located sites cannot be explained satisfactorily as differential returns over "no-rent" sites. Further, the spatial concepts within which urban land functions, locational decisions and revenues have been traditionally examined no longer appear adaptable to modern day urban communities. Analysis of the influence of transportation and other technological improvements upon urban land values has revealed that traditional theory has greatly oversimplified the diverse effects which such developments may have upon the demand and supply schedules for urban land.

The growing complexity in interurban economic relationships emphasizes the need for new concepts and sharpened analytical tools. The model which the author presents for representing the multiple factors influencing the value of urban land provides a useful framework for considering many variables recognized in economic theory as influencing urban land values. An experiment with this admittedly crude model has pointed up some of the major deficiencies in traditional urban land value theory. These criticisms appear to call for a new approach to urban land value theory, grounded in a new set of hypotheses and tested by extensive empirical research. The achievement of such a goal will require extended efforts by many scholars working in the field. It is hoped that some modest beginnings may be made in a subsequent article reviewing previous urban land value studies and examining in more detail data recently developed portraying the trends in land values and related factors in a group of California cities over the past twenty-five years.

Richard U. Ratcliff, who read the above article in manuscript, has been invited to extend discussion of the subject in the November issue of *this journal*.—Editor

China's Land Transformation and the USSR Model

By D. L. SPENCER* *and* V. KATKOFF**

THE IMPORTANCE of agriculture to any country needs no stressing. In China's case, it may well be said that the success or failure of the vast experiments now being attempted may hinge on the fate of the agricultural transformation. Sufficient time has now elapsed to make some attempt to describe and evaluate the initial phase of China's agricultural transition in the light of the precedent of its Russian forbears. For it is clearly only in terms of this latter pattern that modern Chinese phenomena may be approached. To this end the paper is structured by a consideration of Marxian agricultural theory, a recapitulation of Russian collectivization in the frame of which Chinese theories and practice are set out. The land reform is described and reexamined in the eye of comparative conditions. While we are still too close to these events to view them with proper detachment and to formulate very definitive conclusions, it is submitted that summarization and comparative evaluation of the Chinese Communist reforms has a timely importance for those interested in land problems elsewhere. Moreover it is hoped that a foundation for further analytical work will be provided which is superior to the hasty accounts of these events published in the West while the land reform was still in progress. In a similar vein, the arbitrary coverage of land reform with little on collectivization derives not only from space limitations in a single paper but also from the continuing character of collectivization, however accelerated, into the present.

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I. Role of Agriculture in Marxian Theory

A Marxian theory of agriculture, as such, really does not exist. It is part of the whole Communist conception which must be set forth in simplified outline to grasp the role of agriculture. Russian Communism, in its general aspects, is formed on Marx's broad analysis of the economic evils of so-called capitalistic society, which analysis has been interpreted by Lenin, Stalin, Khruschev, and now in China, by Mao Tse-Tung. Perhaps the most fundamental assumption of the Marxian analysis is that the workers are exploited at the hands of the propertied classes. This exploitation is an organic evil, inherent in capitalism which causes a chronic and bitter struggle between the classes. Marx, the philosopher, spitefully attacks capitalism but he is not the bible maker for a new society he is often described to be. He describes what allegedly happens to the working class under capitalism and he calls upon the workers of the world to unite in crushing the parasite, capitalism. At this point his story ends. He does not tell how the emancipated means of production should be used, nor does he tell how the marketing system would operate under the new management. He does not explain how the exchange and distribution systems should be run nor who is to operate them. The Christian Bible, in contrast, does spell out more of what is to be done to reach the desired ultimate goal. Nevertheless, Marx, like the Bible, had many interpretations, and the best student of Marx, according to Com-

munists, is Lenin who has the key to the wisdom transmitted from Marx.[1]

Lenin was the empire builder, and perhaps he should be called the law-giver or, at least the handbook author, of the Communist cause, for he devised the procedures for applying Marxism. Lenin was a dynamic leader of men and women, who absorbed the broad philosophy of Communism into his very bloodstream. He went beyond the mere description of destruction of capitalism. He had to have the power and organization, at any cost and by every means to create the new socialist society. He had to organize a legislature under which society would attain the ultimate goal of complete Communism. He had to set up a body of laws and means by which they might be declared to his followers:

"We are not looking at the theory of Marx as something finished and not to be adjusted. We are convinced that the theory is the cornerstone of that science which socialists must extend farther into all directions if they do not wish to lag behind life. We are convinced that Russian socialists need independent development of Marxian theory."[2]

This explains Lenin's haste in the creation of the early workers' Soviets and trade unions. He intended to use them in the struggle to overcome the bourgeois state which was forcibly resisting all efforts to supplant it. He was convinced that exploitation would be abolished after the workers had taken control and that then the ideal socialist society could be organized.

Marx believed that social change would come from within the workers themselves, but Lenin diverged from this and felt that they must be pushed into socialism. To Lenin the world was a huge socio-economic swamp in which the workers wandered aimlessly, knee-deep in the mud, unable to get out. There is a way out of this swamp, but only a few chosen and trained followers of Lenin know it. Those few keen-minded and ardent believers of Marxism are the leaders of suffering mankind. Because most of the workers are ignorant of the philosophy of Marx and the benefits of Communist society, these leaders must again and again spell out the magic words to the people, to make them understand why they must follow their leaders to find the way out of the swamp. Lenin's principles of leadership of the many by the few developed into the pyramidal structure of the present Soviet government. With Lenin's organizational ideas, Marxism became Marxism-Leninism.

What was this Marxism-Leninism wisdom applied to agriculture? Marx and Lenin held in common the view that a peasantry does not constitute an independent class. It has a dual soul. On the one hand the peasants are workers; on the other, they are private entrepreneurs. Many of them aspire to become rich, but very few reach that goal. For most of them there is one way, the way of degradation, the way of impoverishment. Only socialism can raise the peasantry as a whole through socialized cooperation. Only under socialism will the abyss dividing the cultural city and the ignorant village be wiped out. Agricultural and other kinds of cooperation practiced in capitalistic society, without preliminary seizure of power by the proletariat, cannot lead to the liberation of the peasants because under capitalism, cooperation is part and parcel

[1] In this connection it is interesting to note the similarity to the early interpretation of the American Constitution. Chief Justice Marshall, in his famous opinion in the *Gibbons* v. *Ogden* case, proclaimed that the Congress has an exclusive power over commerce between the states, although the Constitution is not explicit in making power exclusive. But the United States was a young country at that period, and needed even more unifying federal powers than were intended by the Constitution. The Communists, too, interpreted Marxism in the light of existing economic and social conditions. Lenin's New Economic Policy of 1922-1928 is one of the well-known examples of this elasticity.

[2] *Pravda*, January 21, 1947.

of the exploitation of the many by the few. To Lenin, capitalist agriculture was a waste of scarce resources. He said:

"Small size agricultural production hinges on the plundering of the labor and life of the toiler; the plundering of quality and the efforts of draft animals; the plundering of the productive powers of the soil."[3]

As is well known, Marx held that the workers of the cities would carry the spearhead of the revolution. Lenin moved in the direction of accepting the peasants as junior partners in the revolution. However, he never went as far as the Chinese, Mao, in putting full faith and primary emphasis on the role of the peasantry.

II. The Russian Experience

The task confronting the early Bolsheviks was a very difficult one, but there cannot be the slightest doubt that the Soviets were prepared to socialize agriculture from the beginning. The program of the Russian Communist party, approved in March 1919, states that, after the abolition of private property, means and measures must be found for the organization of large-scale socialized farming. The declaration of the policy approved at that time called for the establishment of Soviet agricultural economies, i.e., large socialized state farms and the support of farm communes to be established by the state. But in 1919 conditions were unfavorable for such a move. The peasants knew very little about socialism and the possibilities of the new farm life under it. The government apparatus was, as a whole, weak and there was no agreement among the ruling group about the proper way of dealing with the peasantry. Industry was not in a position to help in the technical transformation of small-scale farming to large-scale collectivized agriculture and there was high hope that a revolution in Europe would make the problem of the peasantry less pressing. With socialized world industries the peasants, it was hoped, would follow the workers' path to socialist cooperation.

Nothing like this materialized and, prior to 1929, small peasant farming was predominant in the Soviet Union. Late in that year the policy was established and the drive begun to collectivize agriculture. The brutal story of the collectivization has been described by others, but here we may concentrate on broader features. The shift to large-scale farming harmonized with the ideological preconceptions which the Communists have concerning the superiority of large-scale methods of production, a preconception inherited from Marx and reinforced by the new faith in the advantages of tractor and combine farming. The ideal agricultural organization would be, according to Marxian theory, state farms where private ownership does not exist. But there were not enough tractors and equipment to organize state farms and the leadership did not know what to do with those peasants who would object to joining such farms. Although large state farms were organized as early as 1918, they were not on the whole an important source of the food and industrial raw materials needed by the nation and they have never taken deep roots in the Soviet Union. In 1937 the state farms produced only 12.7 percent of the total grain needed by the nation.[4] Even in 1955 there were only about 5,000 state farms which during the coming 1956-1960 period were scheduled to produce about 8 percent of the total grain output.[5]

Turning to collectivization, it must be understood that before Stalin launched

[3] S. G. Kolesnov, *Organizatsya Sotsialisticheskikh Selskokhozaystvennykh Predpriatiy* (Moscow: 1947), p. 135.

[4] *Sotsialisticheskoye Selskoye Khozaystvo*, September 1945, p. 7.

[5] *Radio Broadcast*, Moscow, February 28 1956.

his bloody collectivization program, important differences of opinion existed among the Communist leaders on the question of what to do with peasants. The left wing advised looking upon the peasants as a kind of colony which could be exploited to the utmost, pumping capital out of agriculture to build up industry, which later on would help to rebuild backward agriculture. To this group belonged Lenin, Stalin and many others. The right wing not only was against applying harsh measures to peasants but advised the peasants to grow richer (Bukharin's slogan was "enrich yourself"). Preobrazhensky also was for mild treatment of peasants, and he recommended increased production of consumer goods for the peasants who in return would be willing to produce more and sell their surpluses to cities in exchange for consumer goods. By placing high taxes on rich peasants, he expected to accumulate necessary capital for expanding production of industry. This group believed that a gradual and peaceful transformation would take place in the Russian village and that the peasantry would peacefully "grow into" socialism through the cooperation and interdependence of industry and agriculture.

However, Lenin and Stalin did not believe in the goodness of the peasant soul. To quote Lenin:

> "As long as we live in a country of small peasants there is in Russia a firmer base for capitalism than for Communism. One should never forget that. Everyone who observes attentively the economic life in the village as compared with that of the city, knows that we did not pull out the roots of capitalism and did not undermine the base of the inner enemy. Small production generates constantly daily and hourly, spontaneously and on a mass scale, capitalistic bourgeoisie."[8]

It must be remembered that the danger of foreign attack has always been present in the minds of Lenin and Stalin and their followers. In case of war their enemies would try to attract the dissatisfied elements and in 1927 about 82 percent of the Soviet population was still in villages, knowing vaguely about socialism and caring about it not at all. Peasants who had not been collectivized but who saw what was in store for them could make a common front with external enemies as happened during the Second World War in some of the regions occupied by the Germans. Ideal agricultural organization would have been factory-like state farms where attachment to the land could be completely destroyed. But in 1929 there were so many peasants who wanted to be independent entrepreneurs that the Soviet leaders simply were afraid to try such a huge socio-economic experiment.

The Soviet leaders not only were afraid of peasants, they did not trust them under any circumstance. Stalin in particular feared peasants and dared not disinherit them with state farms. At the same time he felt that there must be some political control over them and the second choice was the collective farm. He felt that peasants who were in collective farms could be more easily controlled by propaganda and such measures as short and long-run incentives and flexible taxation. Before World War II Soviet leaders constantly emphasized the fact that complete Communism requires total state ownership of all means of production—which means that the collective farms must eventually become state-owned enterprises. This thinking was inherited from Marx and Lenin and various plans were devised to that effect. However, the events of World War II were so dynamic that they dislocated some of the preconceptions of Marxian teaching. The Soviet leadership appeared content to

[8] J. Stalin, *Sooruzhenye Kolkhozov*, (Moscow: 1930).

rest with collective farms, perhaps on a larger scale, but still collective farms.

Nikita Khruschev came to power at a time when the Soviet society was firmly built and the structure relatively adjusted to collectivization, mechanization, industrialization and innovations. Whereas the Stalinists felt that the peasants could be controlled in state farms better than under any other setup, Khrushev thought in terms of stable control through intensified propaganda and larger number of rural cadres. His original idea of creating "agrogorods," or rural towns, was not successful but his program of merging small collective farms into larger units has met with success. While it cannot be guaranteed that state farms as a further step may not be revived in the Soviet Union, it seems as if the model of Soviet agriculture consists of large-scale collective farms with emphasis on internal technical improvements. During the 1950-1955 period the number of peasant household in collective farms increased by about 39 percent, whereas the sowed area increased by 76 percent.[7] Under these conditions the individual peasant, untrained in management of a large-scale farming enterprise and devoting more of his time to his tasks, would loose his identity as a partner in the enterprise and must depend upon instruction from the above. As a result of those changes, Khruschev achieved political and economic controls of the peasantry without pooling them into state farms and yet moved them closer to the status of factory workers, the original Marxian goal.

III. Maoist Ideas on Agriculture

What were the ideas of Mao Tse-Tung on the role of agriculture? How did they differ from his mentors in the West: Marx, Lenin, Stalin, and Khruschev? It has been said that the theory of Communism suffered decomposition as it moved eastward. Just as the Russian Lenin modified the German Marx, so the Chinese Mao altered the Russian Lenin. Unlike Lenin, Mao changed the stress from the urban proletariat to the peasantry. The Chinese revolution was based upon a tightly organized Communist Party directing a mass peasant revolt against landlords and other potentates of the countryside. However contrary this may have been to orthodox theory as to the development of Communism, there can be no mistaking the certainty with which Mao, the residual leader of the Chinese revolution, placed his finger on the peasant dissatisfaction and rode the powerful wave of their liberated energy to come to power. In contrast, Marx barely considered the revolution occurring in a country as underdeveloped as Russia, let alone China which was and is still more backward. While Lenin did accept the general view that peasant revolution should proceed concurrently with urban change, he still regarded the city proletariat as the spearhead of the movement, hoping that the revolutionary tide of the peasantry would follow as soon as they saw the "light" in socialistic goals.

Mao probably did not entertain these rural ideas much before the break with Chiang Kai-shek in 1927. The agrarian ideas were not so much theoretical notions as a strategic course of action dictated by the circumstances which wiped out the urban communist movement in China and left Mao's rural bases the only effective channel of communism. Moreover, aside from the emphasis on the peasants, Mao's other ideas are quite in line with those of Lenin. In particular, he accepts wholeheartedly the need for a disciplined party based on an inner iron core of oligarchy. It is simply that Mao

[7] *Narodnoye Khozaystvo SSSR*, (Moscow: 1956), p. 129.

makes the peasant play the role that was assigned to the industrial proletariat by the Russians.[8] Later on, after the Communists came to the cities, the urban proletariat was indeed returned to glory in theory as well as practice.

Yet agriculture was still very important to the Chinese Communists. For one thing, socialization of agriculture provides not only the manpower but also the raw materials for industrialization. For another, the landed gentry which had governed China for two thousand years or more sprang from the countryside. These had to be destroyed unless the revolution was to experience the fate of all former conquerors who perforce had accepted the help of these gentry-civil servants. As early as 1926, Mao declared the "real objective of the national revolution" was to overthrow the patriarch-feudal class . . . . which has formed the basis of autocratic government for thousands of years."[9] Destruction of this class was the point of the land reform.

But land reform is not an end in itself. Like their Russian counterparts, Chinese Communists feared the peasants. First they feared their strength which the Communists had just turned to their own account. It would not do to have this new strength turn against Mao's followers. Secondly, the newly liberated peasantry must not be left to their own devices lest capitalism develop spontaneously in the rural areas. Some peasants might become rich even after land reform. Further, as the peasants find the terms of trade turning against them while consumer goods are being neglected in favor of heavy industrialization investments, they will become increasingly reluctant to make available surpluses to the market. Therefore, the Maoist position moves, like Russia before her, inevitably toward collectivization. However, where the Russian peasants were first allowed a long period of time to get used to being landowner entrepreneurs, the Chinese Communists have sought to profit by these mistakes.

Not only has the land reform phase blended into collectivization but this movement was conceived as developing through states of progressive socialization. The stages begin with the simple mutual aid team which, in initial stages, is little more than a temporary work-bee of neighbors existing from time immemorial in rural areas. This takes on gradually more long lasting features, growing in size until it becomes a cooperative. Eventually the highest form of organization, the collective farm, is reached and true socialization has been attained. State farms are not emphasized as a separate or "higher" entity as they were during the Lenin-Stalin era.

The above ideas constitute the barebones of Chinese Communist adaptation of the Marxian-Leninist theory of agriculture. Before turning to the story of the land reform, it may be supplemented by a brief word on some further trappings of Chinese Communist thinking which embellish the framework and adds to understanding events. The laboratory of agrarian change was the rural areas held by the Chinese Communists for many years before coming into control of the whole country. This was true of Manchuria which carried out war-time land reform and collectivization, but the model is evident even in the early days in Hunan. According to this model, peasants are divided into rich, middle, and poor classes, of which only the poor are to be trusted. These give leadership to the revolution and, in fact, according to the Communists, without poor peasants

[8] Benjamin Schwartz, *Chinese Communism and the Rise of Mao* (Cambridge, Massachusetts: Harvard University Press, 1951), p. 189.

[9] Mao Tse-Tung, *Selected Works* (London: Lawrence and Wishart, 1954-1956), Volume 1, p. 25.

China would have no revolution at all. The poor peasant is to be identified in general as one who has to rent land for cultivation, is in debt, and above all, has to sell a part of his labor to others. This latter is the chief criterion distinguishing him from the middle peasant who often possesses land and from the rich peasant who usually has land and regularly exploits others. Landlords, of course, are those who possess large land holdings and who live by exploiting peasants. Landlords along with "comprador vassals of the foreign capitalists" are the chief targets of attack in pre-revolutionary China. Moreover, violence is in order in overthrowing these useless individuals. A revolution was "not the same as inviting people to dinner," said Mao, and it was necessary "to bring about a brief reign of terror in every rural area."[10] These ideas, enunciated in the early microcosm, provide the model of the later development.

In summary, Maoist ideas on agriculture, while bearing a close family relation to those of Marx-Lenin-Stalin, have a certain identity of their own. Unlike Marx and Lenin, Mao not only holds that the peasants are a separate class but predicated his whole movement on the sub-class of poor peasants. When Mao achieved power, his method of handling the peasants was much more adroit, profiting from the mistakes of the Russians. But these differences are mere variants of the Marxian model and Mao simply follows Lenin's interpretation of flexibility of that model. Mao and his cohorts accept fully Lenin's dictum that small peasant enterprises provide a firmer basis for capitalism than for communism and Mao presents a theoretical framework of what should be done in the rural areas which is convergent with that of Khrushev. The ultimate goal for both countries is large collective farms where state control over the peasantry is more effective than in an economy with small enterprises.

IV. Rural Transformation, Pre-1950

Transformation of the countryside lies at the very heart of the Chinese Communists' movement. From earliest beginnings, we see the Communists marching and counter-marching about the Chinese rural areas in response to the pressures of the Kuomintang, changing the locale of their Soviets, but endlessly spreading their propaganda and seeking to stir up the peasantry. In the wake of their armies was always a change in the village structure. While it is true the Communists paid lip service to the orthodox importance of the industrial proletariat, it is not illogical to say that Chinese Communists rode into power intimately associated with the basic issue of "kai-ko" or rural transformation.[11]

The term "kai-ko" has usually been rendered into English by communist sources as land reform or agrarian reform. Western writers have been reluctant to acknowledge the phenomena in such terms. One method of treating the subject has been to place the term, land reform, in quotations while others have used the more neutral term, land redistribution. As has been pointed out, the term "kai-ko" is better rendered as "transformation" and indeed this is much more a key to the events than terms used with such reluctance in the western press.

This transformation was a fundamental change in an age-old system of economic, social, and political relations. Oriental society had always been a top-down structure against which peasants had

[10] Mao Tse-Tung, *Report of an Investigation into the Peasant Movement in Hunan* (Peking: Foreign Language Press, 1953).

[11] C. M. Chang, "Mao's Strategem of Land Reform," *Foreign Affairs*, July 1951, p. 551.

staged numerous revolts in the past. In neighboring Japan, during the Tokugawa period, hundreds of peasant revolts had occurred. In China, from the Red Eyebrows and Yellow Turbans of ancient times to the Nien Fei and Taipings of the nineteenth century, there were always movements of desperation thrown against an outrageous fortune by a downtrodden peasantry. Only the Communists, operating in modern times, succeeded in giving political organization and direction to these spontaneous internal forces. The story of their success in this issue appears largely responsible for the Communist initial truimph in China.

The story of Communist success begins with the formation of rural Soviets in the twenties. Prior to the time of the break with Chiang in the spring of 1927, Mao was sent to investigate conditions in Hunan and his famous report on this subject gives not only a picture of these early conditions but also provides the foundation of the Communist thinking.[12] At the time of Mao's investigation the Communists were still cooperating with the Kuomintang and the violence of the peasant eruption was frightening to moderates both within and outside the party. Mao gives his interpretation of the situation in forceful terms and simultaneously lays down the guide lines on the problem. It is quite clear that this report is a holy writ which sets the framework for the carrying out of the later program.

First, the importance of the peasants to the Communists' cause is stressed in this investigation report. The rise of the peasants is described as a "colossal event," rising like a tornado and breaking through all trammels that bind them. It behoves every revolutionary comrade to recognize this and get ahead of the wave rather than to "follow at the rear gesticulating at them and criticizing them." Secondly, the objective and necessity of land reform is made clear. The main target of the peasants' attack is the landlord class who, according to Mao, have enjoyed their privileges for thousands of years. These must be destroyed because they are the backbone of all systems of authority in China.

Mao tells us that men in China are subject to three kinds of authority and women to four. These are: political authority, clan authority, theocratic authority, and for women, the authority of the husband. They are the four endless cords which bind the Chinese peasants. By destroying the landlord class the other systems of authority begin to totter and eventually will fall, though this may take time. Who will inherit from the destroyed systems of authority? The answer to this question is the peasant association with mutual responsibilities for the whole community. It becomes the sole organ of authority and dictates from thenceforth in the rural settlements. Even small matters such as quarrels between husband and wife must be settled at the peasant association. Absolute authority for the peasant association is vital and even a "brief reign of terror" is countenanced to establish its absolute authority.

What is the structure of this peasant association? Most of the members are poor peasants representing 70 percent of the total rural population. Rich and middle peasants can join the association but they are either wholly or partially inactive in administration of the association. The poor peasants, known to the gentry as "riffraff," are the "main force in the countryside," Mao tells us. Underground or above ground, these poor peasants put up the bitterest and most militant fight against all exploiters. Even

[12] Mao Tse-Tung, *op. cit.*

more important, they accept willingly the leadership of the Communist party.

How does the peasant association operate? First it must "get organized." That is, a group of poor peasants, by themselves or under the leadership of a cadre, hold a meeting at which pledges of loyalty are obtained from each and an association is formed representing local administration. Once formed, the association smashes the prestige and power of the landlord class in various ways. It is given the authority to impose fines and collect forced contributions. The association stages demonstrations against the landlords, swarming into a landord's house and confiscating his grain and hogs. It parades the gentry through the village in tall paper hats, imprisons or banishes them, forces land rent and interest reductions; and the most notorious evil-doers are executed. Here Mao, the apologist, compares these actions with the White Terror, and asks why the peasants should not shoot a handful of landlords and bring about a little terrorism in pursuit of their legitimate ends. In this respect Mao follows the Marxian theory of class war which Lenin and Stalin used in their rise to the power.

An essential feature of the peasant association is its reliance on peasant armed forces. These are built up simultaneously with the growth of the association. They are drawn from two sources: the landlord's militia which is taken over, purefied, and reorganized; and secondly, by the formation of the so-called "spear corps" which means what it says, peasants armed with spears. Reflecting fear of the peasants as in Russia, the Chinese Communists evidently were none too happy about every peasant in possession of a spear. Mao specifically admonishes the comrades not to be afraid of the peasants with spears. "Only local bullies and bad gentry are afraid of them, revolutionaries should not be," he tells his followers. Another essential feature of the peasant association as viewed by Mao was its educational aspect. In the vivid language of his report, he asks:

> "If ten thousand schools of law and political science had been opened could they have achieved in such a short time so much political education among men and women, young and old, all the way into the remote corners of the country as the peasant associations have now done?"

In addition, the report mentions other features including various peasant prohibitions against gambling, opium smoking, conspicuous possession of sedan chairs, sumptuous feasts, and unauthorized slaughtering of draft animals. Various programs for road construction, cooperatives, and education for peasants are to be developed under the aegis of the peasant associations, too. In the latter case, schools were not "foreign style" but functional peasant schools adapted to the need of the country-side.

This report, in substance, is the fountainhead of the land reform. It portrays the Chinese Communist leader as one who, in some measure, was discovering the sequence rather than one who planned it that way. Of course, the Communists were in the midst of this revolutionary activity in central China, but the impression is conveyed that Mao himself was astonished as he recounts the growth of the peasant strength in his native Hunan. In 1926, he tells us, there were only 300,000-400,000 members in the associations. The following year, he estimated their number at 10 millions, or half of the peasants in Hunan. Be his surprise as it may, Mao's report set forth the essentials of agrarian reform philosophy which the Communists utilized thenceforth.

The history of the Communist land reform followed the fortune of the Chinese Communists. When they were displaced from Kiangsi and undertook their well publicized "Long March" to Shensi, land reform went along with them.[13] In Shensi, land reform was carried out but, during the period of the united front against the Japanese, there was a playing down of the movement. Communists' policy shifted from confiscating landlords' land and distributing it to peasants to that of merely reducing land rent and interest paid by the peasants. Restoration and development of agricultural production and encouragement of domestic industry was also a part of this war period policy. No doubt the motive here was conciliation, both of the Chinese moderates and of the Western allies. In any event, once the Japanese war was over the policy was changed back again to confiscating landlord's land and distribution of it to the peasantry. The so-called "surplus" or large acreage of rented land belonging to rich peasants was to be taken away from them; whereas wartime directives had encouraged rich peasants to produce more on their land. Rich peasants constituted an area in which the Communists tightened or loosened the screws in accordance with their strategic power position in some degree resembling precollectivization Russian land policy. As the Chinese Civil War progressed and the Communists felt more confident, they had less solicitude for the rich peasants. Indeed, even middle peasants might be subject to some redistribution of their land in areas where Communist control was firmly established. However, the leadership warned that landlords and rich peasants "cannot exceed a figure of about 8 percent of the rural households" within a community and urged cadres not to "attempt to eliminate the whole feudal system of exploitation overnight," but to use discrimination in carrying on reform.[14]

V. Agrarian Reform in Law and Practice

With the final triumph of the Communists and the promulgation of the Agrarian Reform Law in June of 1950, there was already a vast amount of transformation completed in China. Liu Shao-chi tells us that agrarian reform was already completed, in the main, in an area with a population of 160 millions.[15] This area, mostly in the north, comprised perhaps a third of all China. Thus the Communists came up to the line of departure with a rich experience and very well formulated ideas on what was to be done and how to do it. The Agrarian Reform Law of 1950 is a codification of such information, a sort of constitution and by-laws of the operation.[16]

This reform law consists of forty articles covering every situation that might arise. Its opening article sets forth the purpose which is the abolition of so-called "feudal exploitation by the landlord class" and the introduction of a system of peasant land ownership for the purpose of setting free the rural productive forces, developing agricultural production and paving the way for New China's industrialization. Land, draft animals, farm implements, surplus grain and houses belonging to landlords are to be confiscated, but this does not include land belonging to religious and educational institutions or to industrial and commercial enterprises, even though operated

[13] Mao Tse-Tung, "The Struggle in the Chingkang Mountains," *Selected Works*, p. 87. The early land reform confiscated all the land, but this was soon changed to only that of the landlords.

[14] Mao Tse-Tung and Liu Shao-chi, *Significance of Agrarian Reforms in China* (Bombay, India: Peoples Publishing House, 1950), p. 11.

[15] Liu Shao-chi, "On the Agrarian Reform Law," *Peoples China*, July 16, 1950, p. 5.

[16] *The Agrarian Reform Law of the People's Republic of China*, 2nd ed. (Peking: Foreign Language Press, 1951), p. 98.

by landlords. Land in possession of revolutionary army personnel and certain other classes connected with the Communist Party movement is specifically exempted. Exemptions also exist for aged widows, orphans, invalids, etc., who depend on land for their livelihood. Land belonging to rich peasants, especially that of the semi-landlord class exceeding in size the land tilled by themselves, is subject to requisition. But land and other properties of middle peasants are to be protected from infringement.

Distribution of land is to be made to the poor peasants who have little or no land at all. However, landlords are to retain a share of land in order that they may politically reform themselves through work, but no land is to be given to collaborationists, traitors, and counter-revolutionaries. Administratively, the "hsiang" or village is to be taken as the unit and unified distribution is to be made according to the population therein. Land is first alloted to the tiller who is to retain the approximate average per household holding in the locality. Numerous special provisions regarding reclaimed land, experimental farms, graveyards, shrines, scenic and historic sites, dams, and the like, give some semblance of flexibility to the general prescription.

The section on the method of organization and manner of carrying out the operation is, however, more exacting in tone. Peoples' governments at the county level or above are to appoint or convene conferences to select agrarian reform committees to supervise the distribution of land. But the peasant associations or their committees at the "hsiang" level are to be the executive arm for carrying out the reform. The role of these organizations is to determine class status of each peasant by popular decision in open meeting through general public discussion. Tribunals are established to try and punish hated and despotic elements who have committed heinous crimes and whom the masses demand be brought to justice. But individual actions of violence and killing are strictly forbidden.

This summarizes the legal prescriptions of the land reform and we may ask: how did the program actually work in practice? The Chinese Communists claim that it worked in accordance with the existing laws and was a great force in educating the peasants in self-government. Western writers see it as a distorted program from the beginning, with artificially stirred-up false class distinctions through exploiting minor grievances in the age-old Chinese agrarian problems. The real answer no doubt lies somewhere between these poles but there can be no doubt of the massive transformation which took place in the lives of the peasantry. For their part, the Communists were actively seeking to bring about such a transformation. They have given the world a picture of a typical village land reform program, perhaps dramatized, yet one which is worthy of some study as summarized below.[17] In this account, the simple villagers first hear about the imminence of land reform from telephone workers who are stringing lines to connect the village with higher levels of authority—plugging it in, as it were, with the network. The peasants had indeed heard about land reform. In fact, arrogant landlords had now become quite tractable in various ways, but the peasants were hesitant. For thousands of years there had been little change in the peasants way of life and the brief revolution decades before had only been suc-

[17] Hsiao Chien, *How the Tillers Win Back Their Land* (Peking: Foreign Language Press, 1951).

ceeded by the White Terror period. The peasants were cautious.

However, soon the so-called "work teams" arrived in the village. These are trained cadres who come from higher echelons of the Communist Party. The cadres themselves analyze the situation and size up who are the "worst" landlords. They analyze the peasant association, finding it was organized during the early revolutionary period of rent reduction and deposit-refund campaign and thus contains a relatively high proportion of middle peasants. They find that the association has three divisions, each with three villages, of which the first division has 957 people. But to cadres this is not a reliable guide to the degree of class consciousness of peasants since many of the members enrolled only when association officers went to their homes to canvass for membership. The association, it is agreed, needs strengthening for the tough task of land reform. Next, the cadres meet with the rural intelligentsia such as teachers, etc., who, though often of landlord background, are willing to cooperate by writing blackboard newspapers, staging plays and opening night classes to teach the peasants how to distinguish between the different classes and assess the various degree of exploitation.

At least one cadre is assigned to a village. He takes it to be his duty to hold meetings and listen to people's life stories and interpret them in terms of the class struggle, explaining that the servant in the landlord's house has no land because of the landlord's cupidity, or that the peasant's son was killed because of the reactionary war in which the landlord was deeply involved. All personal troubles can be traced to landlords and "feudalism." Gradually the peasants become agitated, enraged and ready for the mass action. Soon the "worst" landlords are rounded up and are ready for trial by the people. Meantime telephone conversations with headquarters are held and death sentences are judged to be proper for those evil-doers who killed Communists, or served the Japanese or the Kuomintang. Lesser sentences are established for those who merely tyrannized or spread rumors during the land reform. But higher authority reminds them that a mass trial must be held to let all the peasants see the landlords condemned and, if necessary, be executed in order that the peasants may shake off their ancient dread of the landlords. Then the mass trial is held and the "worst" landlords denounced with much hate, condemned by all present and executed.

After this purging, bloodletting drama, the peasants settle down to the detailed problems of registering the class status of everyone in the village. With the cadre in the chair, the peasants at the open meeting decide who is to be classified as a landlord and rich peasant. Eventually the lists are made and sent to "hsiang" government and peasants association for review and ratification. While undesirable village elements are being eliminated, their land and other possessions are being surveyed and recorded along with the needs of the poor peasants. Then the land is actually redistributed to the peasants who proudly go off with their shares and are generally hailed by the Communists as much better off both financially and psychologically.

VI. Critique

What can be said of this roseate-hued picture? The first question we may ask is, did the land need reform in the first place? How valid are the statistics published by the Chinese Communists? Were the peasants really exploited by and full of hate for landlords? Was a vast social change required? Some Western

observers have taken the view that the land reform was largely unnecessary. But the more prevailing Western view is that some land reform was required and indeed long overdue in China. The Kuomintang Party did not or could not provide the change because, while it had pushed the national revolution of 1911, this was a revolution led by merchants and students of the upper classes. These people were, to use Fairbank's expression, "the modern face of the traditional landlord gentry."[18] Indeed, much of the coastal commercial wealth at that time was based on the rents obtained from the rural resources.

Now to look at the statistics. The Communists have persistently held in all their literature that the concentration ratio of land ownership was of the order of ten percent of the total rural population (comprised of landlords and rich peasants), possessing seventy to eighty percent of the total cultivated land, to ninety percent of rural population holding only twenty to thirty percent of the land. According to the Communists, this lopsided distribution was the economic base of the traditional gentry's political and social supremacy. It was the cause of the suffering of the downtrodden peasants. The Communists claim that their land transformation not only eases the peasant hardships, but frees the peasant socially and politically, releasing his energies for greater production.

Where did these statistics come from and how accurate are they? The Communists have not made clear the origins of their figures, but they seem to have simply assumed this concentration ratio to be an indisputable fact, one known to everyone. Wu's excellent study provides us with some good detective work on the possible genesis of these figures.[19] Wu indicated that they were probably based on figures of the Hankow Land Commission of 1928. These figures and those of other Communist writers are shown to have dubious validity. As in the case of other non-Communist writers, Wu's clinching argument is the land ownership figures developed by the distinguished authority, J. L. Buck and others. In his famous study of the 1929-1933 period, Buck found the social distribution of the rural population divided as follows: tenant peasants 17 percent, part-tenant peasants 29 percent and full-owner peasants 54 percent.[20]

Buck himself has made this position even more clear when he states in a recent article that the proportion of farmers who were tenants was no greater than in other important countries; namely, about 25 percent for tenants, another 25 percent for part-tenants, and 50 percent for those who owned the land they work.[21] If the figures for owner and part-tenant peasants are compared with those for poor and middle peasants, they would be much lower than the corresponding Communist data of 90 percent of the total rural population working on only 20-30 percent of the agricultural land. Yet care must be exercised here. Half of the peasant households might indeed have owned the land they worked; but a high proportion of these might have holdings so small as to make them poor or middle peasants like the tenants. The well-known, tiny fragmented farm would tend to support such a thought. Again, Buck's sample was not so large that an error in applying his findings to the country as a whole may be summarily excluded.

[18] John K. Fairbank, *The United States and China* (Cambridge, Massachusetts: Harvard University Press, 1948) p. 209.

[19] Yuan-li Wu, *Economic Survey of China* (New York: Bookman, 1955), p. 119.

[20] J. L. Buck, *Land Utilization in China* (Shanghai, China: Commercial Press, 1937).

[21] J. L. Buck, "Fact and Theory about China's Land Reform," *Foreign Affairs*, October 1949, pp. 92-101.

One way to evaluate the picture of land ownership in China is to consider neighboring Japan. With an intensive rice economy similar to China, there were comparable problems of landlordism and overcrowding on the land. Figures developed by the United States occupation authorities prior to the American-directed land reform in 1947-48, show fairly high concentration ratios in land ownership. In Japan, 50 percent of all farm owners after the war possessed only 18 percent of the total cultivated land and 75 percent of such owners possessed not more than 34 percent of the land. Conversely, 3 percent of large land operators owned 29 percent of the land and 7 percent of land owners had the title to 43 percent of the land.[22] While these statistics do not reach the concentration of land ownership in pre-Communist China, nevertheless they move in the same direction. If we consider that Japanese conditions were those of a much more industrially developed country with outlets for investment other than land, the Red Chinese figures may not be so far removed from the realm of truth and fact.

However, even assuming some degree of Communist statistical exaggeration, would this change the structural picture materially? The landlord class may have held less land, but they were still the political and social masters of the rural scene, an elite class maintaining an ascendancy over the peasants which had to be broken from a Communist point of view. The Communist theoretician, Liu Shao-chi, frankly tells us that relieving the poor peasants of land hunger was not the only aim of the Communists.[23] Redistribution of the land accorded some temporary relief in the short run it was true, but the main point according to him was to "free productive forces from the shackles of feudal land ownership system of the landlord class." The main psychological aim was to stir up the age-old passive peasantry of Pearl Buck's "Good Earth" era. Men with hoes were to become men with civic responsibilities or to use the Communist term, "activists." Their land reform was no mere redistribution of land per se, but a social and psychological transformation aimed at touching every soul in the village.

Cognizance of this dead level of the whole agrarian question and the need for land reform in Asia has not been limited to Chinese Communists. American efforts in Japan were carried on with an understanding of the importance of bringing the peasants themselves into the act of managing their own affairs. The procedures of establishing land reform commissions in the Japanese villages required democratic processes in elections of land commissioners according to strictly defined social categories to enable the program to be carried out with the greatest number of participating villagers. Such was the United States response to the old problem of "feudal" landlordism in Japan. In the western world the term feudalism is meaningless when it is applied to China.[24] But the Chinese Communists use it to describe the picture of the listless, suffering peasants bowing and scraping before the landlords and moneylenders and nothing else.

More recently, the Community Development Projects in India also have shown a similarity of problems existing in the rural areas throughout Asia and the need for stimulation of apathetic peasants from their age-old staticity. Quoting from a United States Congress report

[22] Supreme Commander for the Allied Powers, Natural Resources Section, *Report* No. 79. June 29, 1947, p. 11, and table 6, p. 49.

[23] Liu Shao-chi, "On the Agrarian Reform Law," *op. cit.*

[24] R. H. Tawney, *Land and Labor in China* (New York: Harcourt Brace, 1932), p. 63; also R. Coulborn, *Feudalism in History* (Princeton: Princeton University Press, 1956).

clearly shows a reinvigorating, spiritual transformation in the following words:

"The theory behind (it) is simple: that village leaders, trained briefly under American and Indian guidance and sent out by the Indian government, can be placed in undeveloped villages for the purpose of arousing, leading and training the inhabitants to undertake a bootstrap operation for the betterment of their own living conditions . . . . More important than the actual improvement in health, opportunity and expansion, however, [there has been] the evident rising spirit of pride and self-respect."[25]

It is recognized by the report that change and "activation" must take place, but it is being brought about in democratic terms.

In China the Chiang Kai-shek regime had little opportunity to face this basic problem, which the Communists made their central issue. It is true that no Westerner can condone the cruelty of the land reform program in terms of human suffering and hardship as conducted by the Communists in Russia and China. The Chinese Communists have held that they killed only the so-called "worst" landlords, but it has been estimated that out of approximately 450 million of rural population a million and a half of them have lost their lives as a result of a land reform program less bloody than that of Russia.[26] But to the Communists the means were justified by the ends. While this position is unacceptable for non-Communists, the land reform must be recognized as a necessary change in traditional, inert Chinese society, a change on which the Communists not only rode to power, but laid a foundation for further development of their plans for China.

What was the final result of the land reform in China? After the land reform was basically completed in 1952, China had a total of 134 million hectares of land under cultivation. Of this, 47 million hectares or about 35 percent were redistributed and the land rent to landlords was abolished. In 1955, the land reform program among various minority groups was held completed, but it is not known whether or not these groups suffered as much as the landlord class of the Han people. If there was bloodshed, it was probably on a much lesser scale. As a result of land reform, many poor peasants rose to the average level of middle peasants and no doubt there was some alleviation of the immediate problems of these lower-income groups. However, while the land reform was still in process, the Communist line changed to emphasize the necessity of creation of collective farms. The Red leaders began to point out that land reform was only a transitional step toward collectivization. This has been regarded as a kind of bad faith by some western writers but actually, while the Communists had made a slogan of land to the tiller, there were no specific promises of retention of private peasant farming, not even by the agricultural cooperatives. Distribution of land to the tillers was simply interpreted as land to the collective tillers and plans were pushed to get the collectivization program under way. Thus, as a whole, the collective farm is to be the backbone of the Chinese agriculture as it is in the Soviet Union. Collectivization in China took a great step forward in the middle of 1955. At the end of the first quarter of 1956, out of 110 million peasant households, over 85 percent of them were organized into peasant associations of which over 60 percent actually were collective farms. The Chinese expected to

[25] United States Congress, House Committee on Foreign Affairs, *Report of the Special Study Mission to the Middle East, South and Southeast Asia and the Western Pacific*, May 10, 1956, p. 79.

[26] "The Chinese Communists and the Peasants," *Problems of Communism*, Vol. 1, No. 2, 1952, p. 2.

pool all peasant households into associations by the end of 1956 and by 1959-1960 these were anticipated to be reorganized into collective farms.[27] The progress of collectivization has yet to be seen in the next few years and, considering the current difficulties in agricultural production, Chinese Communists may have to delay their planned collectivization beyond the 1960 goal.

[27] *Radio Broadcast*, Moscow, May 18, 1956 and *Pravda*, January 13, 1956.

Reports and Comments

The Use of the Production Function and Linear Programming in Valuation of Intermediate Products

Introduction

THE valuation of intermediate products has long been a difficult problem in applied economics. Theoretically, the problem is solved by the equation of the marginal value productivity of a factor with its price. For intermediate products it is difficult to obtain accurately marginal value product functions; sometimes the price is also unknown. However, empirical estimates of these magnitudes are needed if the problem is to have a solution. In the problem to be investigated this information is important to both the individual farm manager and the public lands administrator.

The essentials of the problem were set out by Johnson and Hardin[1] in a paper dealing with forage valuation. Their frame of reference was to take acquisition value as the upper limit in valuation and salvage value as the lower limit; between these extremes the marginal productivity value is the relevant magnitude for decision making.

The problem with which this paper is concerned is to estimate the most profitable level of nitrogen fertilizer use in production of wild hay and pasture from mountain meadows.[2] To obtain such an estimate it was necessary to value hay; in the process other inputs were valued. This by-product has interesting implications regarding the administration of public range lands. This paper is organized as follows: (1) a review of alternative methods of resource valuation, (2) a demonstration of the use of a production function in setting up a programming model and (3) valuation of hay, public grazing land and pasture by the use of linear programming.

Methods of Resource Valuation

A commonly used method of valuation is residual imputation. This procedure involves the imputation of the total physical or value product. When this procedure is used the accounting costs of all inputs except the one being valued is subtracted from gross income. The residual is the value attributed to the input in question. The assumptions of this procedure are that the market price of each resource equals its marginal value product and no residual can remain when each factor is imputed its exact reward expressed in terms of market prices. This procedure has two disadvantages—first, the marginal value product does not always equal the market price and second, there is the problem of imputing a return to management and unpaid family labor.[3] Because of the arbitrary assumptions associated with this method it was considered unsatisfactory for the problem at hand.

A second method is the use of multiple regression analysis. The Cobb-Douglas function is the one most commonly used in this type of analysis. This procedure yields the elasticities of the various factors of production and from these the marginal value productivities may be calculated. The method assumes that the products can be aggregated into a single dependent variable expressed in money terms and the inputs can be aggregated into different independent variables. The disadvantages and problems associated with these assumptions have been pointed out by Plaxico,[4] and they seriously

[1] Lowell S. Hardin and Glenn L. Johnson, "Economics of Forage Evaluation," *Journal of Farm Economics*, December 1955, pp. 1457-1459.

[2] The Squaw Butte-Harney Experiment Station carried out trials in 1954 and 1955 to test the hay yield response to nitrogen fertilizer on meadow land in the Harney basin, Oregon, which floods for 8-12 weeks in spring.

[3] E. O. Heady, *Economics of Agricultural Production and Resource Use* (New York: Prentice-Hall, Incorporated, 1952), pp. 407-408.

[4] James S. Plaxico, "Problems of Factor-Product Aggregation in Cobb-Douglas Value Production by Analysis," *Journal of Farm Economics*, November 1955, pp. 664-675.

limit the usefulness of Cobb-Douglas estimates as guides for intra-farm decisions.

In recent years linear programming has come into considerable popularity as a method of maximizing returns to certain limiting factors. Although Dorfman[5] and others have pointed out that resource valuation is implicit in the method, its possibilities in this respect have not been adequately explored in empirical work. The method permits a simultaneous valuation of the resources used in production. In an actual production process this is, of course, what happens. Euler's theorem states this more precisely—if each factor is imputed its marginal product, the total product will be exactly exhausted if the condition of constant returns to scale is fulfilled. Euler's theorem forms the basis of one of the assumptions of linear programming, that of the linear relationship or constant returns to scale. Other assumptions are that the processes available are finite and that the processes are independent, additive and divisible. Since linear programming and multiple regression analysis both permit the rewards to each factor to be determined simultaneously, these models are different from the accounting approach involving the residual imputation procedure in which all but one of the factors must already be valued in order to obtain a solution. As stated above, the Cobb-Douglas function is not generally satisfactory for intra-farm analysis and resource valuation. In cases where the problem and data available are such as to permit the use of the linear programming technique, it would seem that simultaneous solution of rewards to factors of production is more logical than the residual imputation procedure.

Time is also a problem in resource valuation. This problem may be dealt with by discounting expected future revenue and compounding expected future costs. Normally, however, there is not satisfactory empirical data which might provide a basis for estimating both the rate of interest and the time period which should be used. The usual procedure is to apply the current rate of interest and use a time span of 20 to 25 years. Another aspect of this problem is that of adjusting values for risk and uncertainty. Allowance for risk may be taken as the cost of insurance, but there is again no satisfactory standard from which the discount rate for uncertainty may be established. This paper does not introduce risk and uncertainty into the programming model in a formal fashion. The results, however, are interpreted in the knowledge that risk and uncertainty actually exist in the problem situation.

The Hay Production Function

As already stated, the problem towards which the study was directed was the estimation of the economic level of nitrogen fertilizer use in wild hay production from native mountain meadows.

To obtain the hay yield coefficient at any given level of nitrogen it was necessary to construct a production function from the experimental data.[6] In order to select the appropriate regression equation, five expressions representing three types of function were applied to the experimental results. A comparison of these expressions is given in Table I. In terms of biological logic it is difficult to attribute any significance to the powers in the power functions; so, in the absence of any strong statistical reasons for the

[5] Robert Dorfman, *Application of Linear Programming to the Theory of the Firm* (Berkeley: University of California Press, 1951).

[6] Fertilizer trials carried out by the Squaw Butte-Harney Experiment Station. All other coefficients were obtained from a survey of ranchers in the area and market reports.

Table 1.— Comparison of Goodness of Fit Obtained by Use of Different Prediction Equations

Type of Function		Expression	$\leq(y-\hat{y})$	$\leq(y-\hat{y})^2$	Estimating equation
Exponential		$\hat{y} = M(1 - R^x)$	-.021667	.012712	$Y = 3.851755\ (1 - .8^{2.892581\ \ .044435x})$
Power	(1)	$\hat{y} = ab^x$	.015370	.013241	$Y = 0.018244\ (.99635)^x$
	(2)	$\hat{y} = ab_1^x b_2$	-.00370	.000967	$Y = 0.71025\ (.99981)^x\ x^{0.618845}$
Polynomial	(1)	$\hat{y} = a + b_1x + b_2\sqrt{x}$	.000001	.000953	$Y = 1.830943 + .002205x + .097691\sqrt{x}$
	(2)	$\hat{y} = a + b_1x - b_2x^2$	-.000090	.015054	$Y = 1.871226 + .011946x - .000031016x^2$

selection of one expression, biological theories would tend to support the use of either the exponential or the polynomial form. It can be seen from columns 3 and 4 in Table I that the power functions are not superior to the other functions in goodness of fit as measured by the minimum sum of squares. Therefore, the two power functions were eliminated. The minimum sum of squares was used as the basis for selection among the remaining equations. From Table I it will be seen that the polynomial with the form, $y = a + b_1 + b_2$ gives the lowest sum of squares, .000953. But both the b coefficients in this expression are positive, thus giving a continuously increasing function over the entire growth range, which cannot be justified on the grounds of biological theory. Of the two remaining expressions, the exponential, $y = M(1 - R^x)$, has the lowest sum of squares. On this basis, it was selected for use in this analysis.

The total product function was used in the linear programming work described in the next section. Points on the production surface ranging from 0 to 160 pounds of nitrogen were selected. The points were 0, 40, 60, 80, 100, 120 and 160. Each point was selected as a "process" in the matrix. When a process, say, 60 pounds of nitrogen and 2.5 tons of hay, was "selected," further refinement was obtained by including 50 pounds of nitrogen as "processes." If 50 was selected over 60, than we know 50 is to be preferred to either 40 or 60. In this particular problem great refinement in this respect was not warranted. In the next section the programming method is described in greater detail.

The Linear Programming Model

The first step in setting up the initial matrix was to isolate the relevant factors affecting the decision on fertilizer use. A survey was made of the ranches in the area and resource situations in terms of land, labor and capital were determined. The coefficients used in constructing the matrices were obtained from the survey.

A total of three matrices were constructed and solved to obtain optimum fertilizer use under different assumed conditions. The linear programming technique permitted the level of fertilization, the level of beef production and the acreage devoted to different uses to be determined simultaneously. Each "model" is described briefly below.

MATRIX I: This is a two-man unit with six limiting resources. No fertilizer activities were included for reasons that will be apparent later. The range permit was 3,025 animal unit months, the base property consisted of 750 acres of flood meadow, of which 260 acres (Meadow II) gave unsatisfactory response to fertilizer because of deep swales and excess alkalinity of the soil. This area yielded 1 ton of wild hay per acre. The remaining 490 acres (Meadow I) gave a yield of 1.2 tons per acre without fertilizer. This matrix serves as a "check" with which the other matrices can be compared. This might be classified as a "typical" situation without the use of fertilizer.

MATRIX II: This matrix was identical to Matrix I except that fertilizer activities were introduced. Different levels of fertilization were included as processes. This permitted additional pasture and hay to be produced which could be substituted for range land. It also permitted the economic rate of fertilization to be selected.

MATRIX III: Range was permitted to become unlimited in this matrix, the purpose being to indicate the potential of range improvement. In this case there were four limitational resources, Meadows I and II, stacked hay, bunched hay, and four levels of nitrogen on each of the two forage activities. Any additional capital required for the system was assumed to be available at 7 percent interest. In interpreting the data below, it should be borne in mind that bunched hay and stacked hay are fed in combination. All coefficients used in the matrix with the exception of the fertilizer response data were obtained from a survey of the ranchers of the area. In all cases 1956 prices and costs were used.

Optimum Fertilization Rates

The programming model permitted determination of the acreage to be fertilized and the optimum rate of fertilization. The results are presented in Table II. Matrix II shows

TABLE II—FERTILIZER RATES, LAND USE AND BEEF PRODUCTION WITH VARYING RESOURCE SITUATIONS

	Matrix II	Matrix III
Stacked hay.....	282 acres at 50# N	313 acres at 100# N
Bunched hay.....	118 acres at 40# N	177 acres at 90# N
Meadow pasture..	90 acres at 50# N	.....
Increase in beef production over Matrix I.....	26%	66%
Increase in net return over Matrix I.....	$1,443.64	$3,782.13

that a typical ranch situation can profitably apply from 40 to 50 pounds of nitrogen to meadow and pasture. This will permit the additional forage produced to be partially substituted for the public range land.

Of considerable interest is the extent of the limitation imposed by the range resource. The solution of Matrix III indicates that beef production could be expanded by 66 percent if range land were not a limiting factor. This emphasizes the need for an economical method of range improvement and underlines the importance of the work being done by the physical scientists in this area.

Resource Valuation

A by-product obtained from the solution of these models was the valuation of the marginal products. This is the familiar case of the "dual problem" as it has been labeled by Dorfman. These marginal productivity values are presented in Table III.

TABLE III—MARGINAL PRODUCTIVITY VALUES OF RESOURCES

Matrix Number	Ton of Stacked Hay	Ton of Bunched Hay	Per AUM of Meadow Pasture	Per AUM of Range
I.....	10.81	9.64	.....	5.17
II.....	14.06	12.81	3.06	4.51
III.....	24.13	22.77	.....	.....

The reader may be surprised at the productivity values when it is realized the marginal productivity of hay increases with heavier rates of nitrogen application. Upon consideration, however, one familiar with the programming technique will not be dismayed. In Matrix I the marginal value productivity of hay is lowest because of the "tight" range limitation. However, in Matrix II where fertilization of hay and pasture is allowed, it becomes profitable to substitute increased hay and pasture for range which "loosens" the range restriction and results in higher hay MVP's. Finally, in Matrix III where range is unlimited it pays to increase production of hay to a point indicating a very high marginal productivity value to utilize the feeding value of the relatively cheap range. Hay becomes very valuable in this last case because of the complementary relationship between hay and range; some hay is required for beef production for wintering even though range is utilized to the utmost extent.

Conversely, the MVP's of range are lowered as the quantity of relatively cheap range is allowed to increase. In Matrix I range is very much a limiting factor and the MVP is high. In Matrix II it is less limiting as hay and pasture is substituted for it. Finally, when range becomes unlimited, its MVP goes to zero; the rancher would be unwilling to pay anything for an additional unit.

It is possible the marginal productivity values are slightly overestimated. Some overhead costs that do not change with fertilization were omitted from the analysis. Such costs, however, are quite minor. It is interesting to note that a minor amount of hay was sold in the area in 1956 which ranged in price from $12 to $15 per ton.

The discrepancy between these estimates, $5.17 and $4.51, and the rent actually charged by the Bureau of Land Management needs explanation. This charge varies from $0.15 to $0.44 per AUM. In the first place, the estimate of $4 to $5 per AUM should be discounted for risk and uncertainty. Because of the high degree of risk and uncertainty associated with the desert cattle operation, the discount rate could well be as high as 50 percent. If this were the case, the estimate would be reduced to $2 to $2.50. The historical aspect is also a factor in explaining this discrepancy. Originally the range land was free, and when it came under administration of the Forest Service and Bureau of Land Management, neither agency felt justified in charging the full market price for grazing rights. This feeling still prevails. Originally, of course, when an abundance of range existed, its value was much lower than at present when it is very much a limiting resource. It is also likely that the value of the range land has increased over time and it is doubtful that prices charged by the government agencies have kept pace.

It should be pointed out, however, that the discrepancy does not necessarily mean a subsidy to present operators. The excess value of the range permit has been capitalized back into the base acreage in many cases. The purchaser of a range unit at the present time would be paying for this surplus in advance. Many of the present operators have already paid for this excess value over cost. Whenever a discrepancy of this kind occurs, however, definite administrative problems are

created. While this study was not mainly concerned with policy problems, certain policy implications are apparent.

Conclusions

Where suitable input-output data are available, linear programming provides a method of valuation for productive inputs. It overcomes many of the limitations of other methods. One problem in the use of this technique is the introduction of sufficient subjectivity, which can be readily incorporated in budgeting. Linear programming may often be too complicated or cumbersome to replace budgeting in an economic analysis. However, it has a superior feature in that it permits simultaneous determination of the optimum level of output, the combination of processes to be used, and the valuation of the limiting resources.

In the research reported in this paper the optimum level of beef production and the economic rate of fertilization were determined. In addition, values of hay, pasture and range land were obtained. The hay values are of primary interest to the individual rancher who must choose between fertilization and other methods of obtaining hay. The value of the range is of interest to those involved in research on and management of publicly-owned resources.

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Mobility, Turnover, and Vacancy Rates

THERE is an obvious relationship between population mobility and the availability of housing, but this relationship has received relatively little attention in recent years. Vacancy rates, in contrast, have found frequent application as a measure of housing availability. The value of data on population mobility, both to supplement vacancy rates and where necessary to replace them, should not, however, be disregarded.

The two concepts differ significantly in common usage. The vacancy rate is usually taken as the number of dwelling units vacant on a specified date expressed as a percent of all units standing on that date. Sometimes reference is made to an "effective" vacancy rate, in which only vacant nonseasonal not dilapidated units for rent or sale are included, but the data still pertain only to a single point in time. The mobility rate, in contrast, may be defined for purposes of this paper as the number of household heads living in a different house on a given date than a year earlier, expressed as a percent of all household heads surveyed. The mobility rate, so defined, is synonymous with the turnover rate for occupied dwelling units.

The vacancy rate, as presently conceived, has received widespread study since the 1930's. The real property inventories and surveys conducted in many American cities during that period systematically obtained detailed statistics on local vacancy rates. Compilation of vacancy data was extended to other communities by the 1940 United States Census of Housing, the first to provide nationwide housing information on a comprehensive scale.

The past decade has witnessed increasing attention to vacancy research. The 1950 Census of Housing, for example, presented separate statistics on number of dwelling units in structure, plumbing facilities, number of rooms in dwelling unit, and contract monthly rent or value of structure, for vacant nonseasonal not dilapidated units for rent or sale as well as for occupied units.[1] Quarterly estimates of vacancy trends have been made available on a regional basis since 1955,[2] and a national inventory of housing, with separate tabulations for selected metropolitan areas, has recently been completed. In many communities, the Federal Housing Administration now joins with postal authorities to conduct annual surveys of vacant dwellings. Techniques for making local vacancy studies have been described in detail by the Housing and Home Finance Agency,[3] which has also

[1] U. S. Bureau of the Census, *U. S. Census of Housing: 1950*, Vol. I, *General Characteristics, Part 1: U. S. Summary* (U. S. Government Printing Office, Washington, D. C., 1953), Tables 5, 7, 9, 14, 16-19, 21-24, 26-29, and 31.

[2] U. S. Bureau of the Census, *Housing and Construction Reports, Housing Vacancies*, Series H-111. Available from the Bureau of the Census.

[3] Housing and Home Finance Agency, *How to Make and Use Local Housing Surveys* (U. S. Government Printing Office, Washington, D. C.), April 1954.

published an excellent analysis of "Inventory Utilization as a Market Indicator."[4]

Research in population mobility has progressed much more slowly. Although limited mobility data were compiled as part of the 1940 U. S. Census and various sample censuses taken during the following decade, it was not until 1950 that the first small-area statistics on short-term population movements were compiled on a uniform nationwide basis.[5] Annual studies at national and regional levels, comparable to the 1950 Census figures, are now regularly issued by the Bureau of the Census.[6] As yet, however, no major studies have focused attention on the mobility of household heads (as distinct from the total population) and contributions corresponding to the FHA-Post Office surveys and HHFA manual cited earlier have yet to appear in the literature on mobility.

Despite this lack of emphasis, it should be evident that population mobility, viewed as housing turnover, bears a close relationship to the availability of housing. Clearly, turnover creates vacancies—a period of vacancy is bound to occur between the departure of one tenant and arrival of another, even in times of great shortage. Housing analysts sometimes refer to the resulting vacancy as "frictional"; such frictional vancancies may tie up as much as one percent of the total inventory. Inasmuch as vacancies mirror turnover, the latter might reasonably be expected to serve as an accurate index of the former.

Turnover data have potential value in supplementing as well as substituting for vacancy rates in the analysis of housing availability. Vacancy rates indicate the prevalence of available housing at a given moment in time but cannot possibly show how often housing becomes available over a period of time. Frequency—the number of times a household has the opportunity to compete for housing rather than the number of such opportunities existing at a given moment—can be measured only by turnover data. The two concepts refer to complementary aspects of the same general problem.

[4] Housing and Home Finance Agency, *Housing Market Analysis* (U. S. Government Printing Office, Washington, D. C., December 1953), Chapter IV.

[5] U. S. Bureau of the Census, *U. S. Census of Population: 1950*, Vol. II, *Characteristics of the Population*, Part I: United States Summary (U.S. Government Printing Office, Washington, D. C., 1953), tables 70, 86, and 93.

[6] U. S. Bureau of the Census, *Current Population Reports, Population Characteristics*, Series P-20. Available from the Bureau of the Census.

The correlation between vacancy and turnover rates is apparent from analysis of United States Census statistics. Although exhaustive analysis of this relationship is beyond the scope of the present research, the work so far completed appears to be reasonably conclusive.

TABLE I—VACANCY RATES, 1950 AND 1956, AND TURNOVER RATES, 1949-1950 AND 1955-1956, FOR THE CONTINENTAL UNITED STATES

Region	Vacancy Rates[1]		Turnover Rates[2]	
	April 1950	1st quarter, 1956	April 1949-1950	March 1955-1956
All Regions.....	1.6	2.7	19.0	21.0
Northeast.....	1.1	1.7	12.7	14.8
North Central.....	1.1	2.0	17.2	20.5
South.....	2.0	3.2	22.8	23.4
West.....	2.7	4.4	26.9	28.8

[1] Vacant nonseasonal not dilapidated dwelling units for rent or sale as a percent of all dwelling units.

[2] Persons one year old and over living in a different house at the end of the period than at the beginning of the period as a percent of all persons one year old and over at the end of the period. Includes persons not reporting mobility status.

Source: U. S. Bureau of the Census, "Vacant Dwelling Units in the United States: First Quarter 1956," *Housing and Construction Reports, Housing Vacancies*, Series H-111, No. 4, July 17, 1956, table 1; *U. S. Census of Population: 1950*, Vol. II, *Characteristics of the Population*, Part 1: United States Summary, U. S. Government Printing Office, Washington, D. C., 1953, table 70; and "Mobility of the Population of the United States: March 1955 to 1956," *Current Population Reports, Population Characteristics*, Series P-20, No. 73, March 12, 1957, tables 1 and 10.

Table I presents a comparison of vacancy and mobility (or turnover) rates by region and year, 1950 and 1956. It is immediately evident that, for the nation as a whole and for each of the four regions, increases in vacancy rates were accompanied by corresponding increases in turnover. Furthermore, for both periods the ranking of the regions with respect to vacancy rates was identical to that for turnover.

A similar relationship was indicated by analysis of data for the twenty-five "urbanized areas" with 1950 populations over 500,000. For these major urban centers, the coefficient of correlation between population mobility or turnover (that is, persons one year old and over occupying a different house in 1949 than in 1950 as a percent of all persons one year old and over in 1950) and the percent of dwelling units vacant nonseasonal not dilapidated, for rent or sale in 1950, was

+0.81.[7] It seems likely that computations for other areas or years would present much the same picture.

To determine whether the correlation between vacancies and turnover held for subareas within a city as well, the author analyzed 1950 census tract statistics for two cities with which he was familiar. Correlations were based on data for twenty tracts selected at random for each of the two cities. Coefficients were high in both cases: for Cincinnati, r = + 0.78, and for Seattle, r = + 0.73.[8]

It should be remembered that population mobility rates available from the 1950 United States Census and used in computing the foregoing correlations are not precisely the same as those necessary for turnover analysis. As noted above, the Census data referred to the total population one year old and over, thus including the quasi household population (persons living in rooming houses, institutions, dormitories, and other "nondwelling-unit quarters") as well as those living in regular dwelling units. A more suitable unit of analysis for turnover studies would be the household head. There is some indication that statistics of the desired type, giving "year moved into unit" by census tract, will be included in the 1960 United States Census of housing.[9]

Such turnover rates, based on mobility data for household heads only, are already available for Honolulu. In January 1957, the Honolulu *Star-Bulletin* and Honolulu Redevelopment Agency jointly conducted a "consumer analysis" of the type now available annually for more than twenty large cities.[10] Various population and housing questions, including one on place of residence a year earlier for the household head, were addressed to a random sample of 2,000 households.

[7] Computed from Bureau of the Census reports cited in footnotes 1 (table 32) and 5 (table 93).

[8] Computed from the U. S. Bureau of the Census, *U. S. Census of Population: 1950*, Vol. III, *Census Tract Statistics*, Chapters 11 and 51 (U. S. Government Printing Office, Washington, D. C., 1952), tables 1 and 3.

[9] U. S. Bureau of the Census, *Preliminary Statement of Publication of Statistics by Census Tracts from the 1960 Censuses of Population and Housing*, October 24, 1956, outline for table 5.

[10] See Edward J. Burns, "Honolulu Housing Statistics Up-Dated via Cooperation in Newspaper Survey," *Journal of Housing*, November 1956, pp. 400-401, for an account of a similar survey made in January 1956. Results of the 1957 study will be reported in forthcoming publications of the Honolulu Redevelopment Agency.

TABLE II—VACANCY RATES, 1950, AND TURNOVER RATES, 1956-1957, FOR THE CITY OF HONOLULU

Kind of Housing	Vacancy Rates, 1950[1]	Turnover Rates, 1956-1957[2]
All categories	2.4	25.4
Tenure and rent		
Owner occupied or for sale	0.9	9.9
Renter occupied or for rent	3.5	36.7
Less than $50 (except rent free)	3.3	14.2
$50 to $74	4.3	41.4
$75 or more	4.7	54.4
Number of dwelling units in structure		
1 dwelling unit	1.1	15.5
2 dwelling units	1.8	26.4
3 or 4 dwelling units	3.4	41.5
5 or more dwelling units	8.4	48.7
Number of rooms in dwelling unit		
1 to 3 rooms	4.9	44.7
4 rooms	1.5	25.3
5 rooms	1.1	19.4
6 rooms or more	0.8	14.1
Condition		
Dilapidated or needing major repairs	3.6	17.6
Not dilapidated or needing major repairs	4.4	27.2

[1] Except for data on condition, vacant not dilapidated dwelling units for rent or sale as a percent of all dwelling units in the corresponding category. For condition, vacant dwelling units (regardless of availability) as a percent of all dwelling units in the corresponding category.

[2] Occupied dwelling units with a household head reporting a different place of residence in January 1956 as a percent of all occupied dwelling units in the corresponding category, January 1957.

Source: Vacancy rates from U. S. Bureau of the Census, *U. S. Census of Housing; 1950*, Vol. I, *General Characteristics*, Chapter 52: Hawaii, (U. S. Government Printing Office, Washington, D. C., 1952), tables 13, 14, 16, and 17. Turnover rates from unpublished study by Honolulu Redevelopment Agency.

The 1956-1957 turnover data were then analyzed by type of housing and compared with corresponding vacancy statistics from the 1950 Census of Housing. These comparisons, presented in Table II, reveal considerable similarity. Both vacancy and turnover rates were higher for rental housing than for sales housing, for high-rent than for low-rent units, for units in multi-unit structures than for 1- and 2-unit housing, for units with three rooms or less than for larger units, and for standard housing than for substandard units. The parallel between vacancies and turnover is especially striking in

view of the almost seven-year interval between the two surveys.

The evidence strongly suggests that turnover data may well be substituted in certain cases for the more commonly found vacancy statistics. Not only are turnover rates highly predictive of the corresponding vacancy rates, but they also stress an aspect of the problem of housing availability not easily approached by the older techniques.

A third consideration—and one not readily ignored—is the lower cost inherent in turnover surveys. "Effective" vacancy rates usually range between one and four percent at the citywide level, and a difference of only two or three percentage points may reflect the difference between an acute housing shortage and a wide availability of accommodations. Such fine distinctions require a relatively large sample. The corresponding turnover rates, in contrast, may range between fifteen and thirty-five percent. Variations of this magnitude can be accurately measured with a sample of comparatively limited size.

A concrete illustration is provided by the analysis reported earlier of the twenty-five "urbanized areas" over 500,000 in 1950. It will be recalled that the coefficient of correlation between vacancies and mobility for these areas was +0.81. The regression equation was $Y = 9.912 + 5.866436X$, and indicated the following relationships:

Vacancy Rate (X)	*Turnover Rate* (Y)
0.0	9.9
1.0	15.8
2.0	21.6
3.0	27.5
4.0	33.4

Use of turnover rather than vacancies as the index of housing availability may make it possible to reduce sample size by two-thirds or more. Assuming the relationship indicated by the above equation, distinction between vacancy rates of 1.0 and 3.0 percent would require successive samples of 376 dwelling units to assure significance at the 0.05 level. Distinction between the corresponding turnover rates (15.8 and 27.5) would require successive samples of only ninety-five units to attain the same degree of significance. If it is desired to differentiate between vacancy rates of 1.0 and 2.0 percent, two samples of 1,135 units each are necessary; distinction between the corresponding turnover rates (15.8 and 21.6), in contrast, demands only 347 occupied units in each sample.

In view of the foregoing discussion, it would seem that population mobility and turnover data merit much greater attention than they have been given in the past, both as an inexpensive substitute for vacancy rates and as an important measure in their own right of the availability of housing.

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The Rural-Urban Fringe Taxation Problem: A Case Study of Louth Township†

URBAN Drones in Rural Hives is the title of a tax study of Westminster Township done by A. J. Barker in 1949.[1] In it he concludes that "the average suburban person *receives* township services to *twice* as great a value as the average farm person, but *pays* only *half* as much as the average farm person towards provision of those services." Barker's study gives quantitative support to the contention of rural municipalities that the urban people who move to the suburbs do not pay their share of the additional service costs they impose upon the rural municipality.[2]

† The research upon which this article is based was done for the Louth Township Land-Use Committee of the Ontario Department of Agriculture during the summer of 1956. Acknowledgement is made to E. F. Palmer, Director of the Horticultural Experiment Station, Vineland Station, and E. G. Pleva, Chairman of the Department of Geography at the University of Western Ontario, who gave freely of their time for consultation purposes, and to I. Rolfe, Clerk of Louth Township, who made available all of the township records used in this study.

[1] Westminster Township is part of the rural-urban fringe of London, Ontario (Population just under 100,000 in 1949). The London and Suburban Planning Board have published the study in mimeograph form.

[2] R. Barlowe gave a good summary of the general rural opinion concerning the economic costs of suburbanization in a paper entitled, "Our Rural-Urban Explosion—What Can We Do About It?" which was read at the Michigan Resources Conference, January 1955.

However, Barker's non-farm samples were chosen predominantly from built-up suburban areas contiguous to the city and most of his farm samples were mixed grain and livestock farms of about 100 acres. Would Barker's conclusion hold true for a rural-urban fringe in which the non-farm development takes the form of villages and dwellings scattered throughout the rural area? Would it hold true in an area with smaller, more highly specialized farms? Would it hold true for fringe areas of cities of all sizes? In summary, can Barker's conclusions be applied to all rural-urban fringe areas, or is Westminster Township merely a unique case?

Before these questions can be answered, more research is necessary in different types of fringe areas of different sized cities surrounded by different types of agricultural activity. It is the hope of the writer that the following study of Louth Township will be some contribution to the fund of knowledge about the rural-urban fringe which is necessary before principles can be developed and problems solved.

Semi-Urban Development in Louth Township

Louth Township is located in the Niagara Peninsula of Ontario, Canada. It is part of the rural-urban fringe of St. Catharines, a city with a population of 39,000. St. Catharines' rapid suburban growth is attested by the fact that Grantham Township, within which it is situated, has grown in population from 7,400 in 1945 to 26,000 in 1955. Louth Township, immediately west of Grantham Township, has only begun to feel the effects of the St. Catharines "urban explosion." Nevertheless, it has had a considerable growth of population in the last decade, increasing from 3,500 in 1945 to 4,900 in 1955.[3]

Most of this increase consists of non-farm people who live in Louth Township and work in St. Catharines. The housing development for these non-farm people in Louth Township has not taken the subdivision form characteristic of suburban growth. Instead, individual houses have spread across the township, concentrating to sone extent along the highways and other main roads, and around the police villages[4] in the intensive fruit growing area north of Highway 8.[5] For these people who are not truly rural because of their reliance on the city for their employment, their shopping, and their social and cultural activities, the term "semi-urban"[6] seems appropriate, and will be used in this study. The term "non-farm" will refer to both the semi-urban and police village population.

This increase of semi-urban population in Louth Township has been accompanied by an even more rapid rise in property taxes. This has been particularly true of the school tax, which in 1955 comprised approximately two-thirds of the total township taxes. While the population increased by 40 per cent between 1945 and 1955, the school levy rose by approximately 500 percent in the same period.

Table I gives the composition of the tax rates for 1945 and 1955. Note that the rise in the elementary school rate makes up over half of the total increase. Almost half of the county rates is for secondary school purposes.

The rise in tax rates, along with an increase of tax assessments, has had the net effect of raising taxes on farm land by approximately 200 percent in ten years. Township officials attribute this increase in farm taxes to the increase of semi-urban population. This is tested in the following research by determining the taxes yielded and the costs of services provided for the average farm and non-farm unit.

[3] The population figures given here are from the municipal assessment rolls. They are rounded to the nearest hundred.

[4] In Ontario a police village is a "semi-incorporated" village usually ranking in size between an unincorporated hamlet and an incorporated village. The trustees of the police village have limited jurisdiction which does not include taxing power. Any funds desired by a police village must be collected by the township in which it is located.

[5] The generalizations here about Louth are based on the *Report of Geographical Investigations of Louth Township, 1955*, by C. Whebell, R. Krueger, C. Kelly. A Preliminary report published in mimeograph form by the Ontario Department of Agriculture Louth Township Land-Use Committee.

[6] The term "semi-urban" was first proposed by J. F. Hart in "The Distribution of the Rural Nonfarm Population in Georgia," *Georgia Academy of Science*, Vol. 13. On the basis of his study in Georgia he suggested that the term semi-urban apply to all the rural non-farm population, including villages. Whebell, Krueger, and Kelly, *op. cit.*, found that in Louth Township the people of the police villages are much more a part of the rural community than are the people of the scattered non-farm homes. In this study the writer is therefore limiting the use of semi-urban to refer to the latter group who are more urban in nature. This facilitates distinguishing between the unagglomerated non-farm population and the agglomerated non-farm population for which there is already the accepted term of police village.

TABLE I—INCREASE IN TAX RATES, LOUTH TOWNSHIP: 1945-1955[1]

	County	Township	School	Total
1945.....	18.0	9.5	12.6	40.1
1955.....	26.8	13.0	28.9	68.7
Increase.....	8.8	3.5	16.3	28.6

[1] The tax rates are given in mills. The school and total rates given here are weighted averages. The total rates for the various school sections ranged from 31.2 to 50.0 in 1945, and 53.9 to 70.8 in 1955.

Population Data

The Clerk[7] of Louth Township was of great assistance in going through the 1955 assessment roll and separating the farm holdings from the non-farm holdings on the basis of occupation of the owners or lessees. He was able to do this adequately because he has a personal acquaintance with every taxpayer in Louth Township. The problem of which category the part-time farms should go into was resolved in the following manner. A part-time farm whose operator held a full-time job away from the farm was classified as non-farm. A part-time farm whose operator held only a part-time job away from the farm was classified as farm. When a holding was farmed, but the house was rented to someone working at other than farm work, the land was classified as farm, the house as non-farm.

The basic population data used in this study is given in Table II. It is interesting to note that Louth Township, which is considered rural by its residents, has more non-farm units than farm units, and a larger non-farm than farm population. The non-farm population is 72 percent semi-urban, 28 percent police village. Most of the semi-urban population has come since 1945. The police villages have had a relatively small population increase in the last ten years.

[7] Besides being Clerk, he is also Assessor, Tax Collector, and Treasurer.

TABLE II—POPULATION DATA, LOUTH TOWNSHIP: 1955

	Units	Population	Persons Per Unit	Children Under 6 Yr. Per Unit	Children 6-14 Yr. Per Unit	Secondary School Students Per Unit
Farm.....	506	2,272	4.49	.45	.85	.16
Non-farm.....	651	2,631	4.04	.58	.77	.17

Table II shows that there are .45 more persons per farm than per non-farm unit. This is a total township average and does not hold for all areas of the municipality. In half of the school sections the non-farm average of persons per unit is higher. The same goes for elementary school age children.[8] Although the township average shows that there is a slightly higher number of school age children per farm than per non-farm unit, the reverse is actually true in six of the ten school sections. It is significant that the four school sections which have a higher number of both persons per farm unit and school age children per farm unit lie within the intensive fruit growing area of the township. This higher population ratio may result from the high demand for labor and the high productivity of fruit farms. Fruit farmers do tend to have larger families than grain and livestock farmers, and often employ married people with large families (very often immigrants) the year round.[9]

[8] The provincial average age of elementary school pupils is 6 to 14 years.

[9] Whebell, Krueger, and Kelly, *op. cit.*

For children under six years of age the non-farm units have a higher average. The three school sections in which the farm average is higher in this respect are again in the intensive fruit growing area. The difference between the farm and non-farm secondary school students per unit is so small as to be almost insignificant. The secondary school student data was not collected on a school section basis.

The police village population and number of children per unit is lower than either the total non-farm or farm average.

Evaluation of Unit Service Costs and Tax Yields

It was decided that education and welfare are the only costs which can be fairly apportioned to farm and non-farm units according to the actual value of services received. The costs of other services are apportioned on a per capita basis on the assumption that these costs are proportional to the size of population. All service costs are levied township costs, i.e., the amount which has to be made up by the taxpayers of the township after provincial grants and other miscellaneous income are subtracted from the total costs. Services provided on a local improvement basis are not included, because in such case each user pays for the services received.

The method used to apportion the various service costs between farm and non-farm is given below:

ELEMENTARY EDUCATION

$$\frac{\text{No. Farm Pupils}}{\text{Total No. of Pupils}} \times \text{Levied Cost} = \frac{\text{Farm Share}}{\text{No. Farm Units}} = \text{Farm Unit Share}$$

SECONDARY EDUCATION

$$\frac{\text{No. Farm Students}}{\text{Total No. of Students}} \times \text{Levied Cost} = \frac{\text{Farm Share}}{\text{No. Farm Units}} = \text{Farm Unit Share}$$

WELFARE

$$\frac{\text{Levied Cost of Welfare to Farm People}}{\text{No. Farm Units}} = \text{Farm Unit Share}$$

REMAINING SERVICE COSTS[10]

Levied per Capita Cost × No. Persons per Farm Unit = Farm Unit Share

By exchanging the word "non-farm" for "farm" exactly the same procedure as shown above was used to determine the per unit non-farm service costs.

The per unit tax yields were obtained by first multiplying the farm and non-farm total assessment for each school section by the tax rate for that section, and then dividing the total farm and non-farm taxes by the number of farm and non-farm units respectively. Because of the significant school section distribution of population data, the tax yields were worked out for each school section as well as for the whole township. The average farm tax yield is $237.16; non-farm $85.32. The average tax yields for the different school sections range from $177.78 to $325.50 for farms, and $54.85 to $115.31 for non-farm units. The school section with the *lowest non-farm* tax has 1.23 *more* persons and .39 *more* school age children per non-farm unit than the school section with the highest non-farm tax. On the other hand, the school section with the *lowest farm* tax has 2.80 *fewer* persons and .85 *fewer* school age children per farm unit than the school section with the highest farm tax. In other words, the tax yields of farms tend to be proportional to their costs of services, whereas the tax yields of non-farm units tend to be inversely proportional to their costs of services.

[10] This includes general government, protection of persons and property, public works, sanitation, recreation, debt charges, county taxes (excluding secondary education costs,) and other miscellaneous municipal costs. The amount, $14.49, was derived from information given in *The Auditor's Report for 1955, Louth Township.*

By dividing all of these remaining costs between farm and non-farm the writer is assuming that industry, commerce, and summer cottages do not cost the township anything to service. Although not strictly correct, this assumption was made because of the impossibility of determining exact service costs of industry, commerce, and summer cottages. If apportionment were made on an assessment basis they would be assigned 13 percent of the remaining service costs. This would make a difference of less than $2.00 per capita. The Township Clerk estimates that the actual cost of industry, commerce, and summer cottages is much less than this. In any case, it would not alter the proportion of remaining service costs to farm and non-farm units.

A summary of services costs and tax yields per unit is found in Table III. This table shows that the average farm unit receives only slightly more in services than the average non-farm unit, but yields almost three times as much in taxes. The average non-farm unit receives approximately $82 more in services than it yields in taxes. At the current tax rate the non-farm unit would require an average assessment of approximately $2,500 to pay for the services it receives. The present average non-farm assessment is approximately $1,300 per unit. Only 16 non-farm units of the 651 have an assessment of $2500 or more. This means that only 2.5 percent of the non-farm units are paying their own way.

TABLE III—SUMMARY OF AVERAGE COSTS OF SERVICES RECEIVED AND AVERAGE AMOUNTS OF TAXES YIELDED PER UNIT, LOUTH TOWNSHIP: 1955

	Farm	*Non-Farm*
Education		
elementary	$ 74.97	$ 68.13
secondary	29.41	32.35
Welfare	3.55	8.10
Other	65.06	58.54
Total Cost of Services per Unit	172.99	167.12
Taxes Yielded per Unit	237.16	85.32
Farm Credit per Unit	$ 64.17	.....
Non-farm Deficit per Unit	$ 81.80	.....

The police villages yield less taxes per unit than the township non-farm average because they receive a special tax reduction of 4 mills, but they also have a lower demand for services because of their smaller number of persons (particularly school age children) per unit.

The average farm unit yields approximately $64 more in taxes than it receives in services. This means that the farmers subsidize the non-farm people by approximately $32,000 annually. The balance of the $53,000 deficit incurred by the non-farm people is made up by taxes paid by industry, commerce, and summer cottages. If the present trend of development in Louth Township continues, the tax burden on farms[11] will increase year after year because housing is increasing at a much more rapid rate than commercial and industrial development.

There are other factors which were not used in this study because of the impossibility of translating them into dollars-and-cents value. For instance, Barker's Westminster Township study showed that the suburban population was more mobile than the farm population and, since the incoming people were usually families with young children, over a number of years the suburban dwellings sent a much larger number of children to school. Since most of the semi-urban development in Louth Township is very recent, it is impossible at this time to measure any mobility trend. Although the number of pre-school children (under 6 years) in Louth Township was not used in determining costs of services, the fact that there are more pre-school children per non-farm unit indicates that the non-farm share of education costs will increase in the future.

The Township Clerk states that the non-farm people, particularly the semi-urban people who have been accustomed to urban amenities, vigorously demand improvements in municipal services with which the farm population has long been satisfied. He attributes, for instance, the increase in per capita recreation costs from $.03 in 1951 to $.54 in 1955 to the increase of semi-urban people. He also claims that the semi-urban people demand better police and fire protection, and more road services in the nature of laying dust in the summer and sanding icy roads in winter.

[11] In the summer of 1955 the writer interviewed several hundred farmers in Louth Township to determine the factors causing farm land to be sold for non-farm uses. The factor given most often was rising real estate taxes. Other factors mentioned were high prices for land, and an instable market for fruit. See Whebell, Krueger, and Kelly, *op. cit.*

The various immeasurable factors described above reinforce the conclusion that the non-farm people are not paying their own way as far as municipal service costs are concerned.

Conclusion and Application

This study of Louth Township helps answer two of the questions raised earlier about Barker's Westminster Township study. Like the suburban development, both semi-urban dwellings scattered throughout the rural community and police villages impose a tax burden upon the farmers. Although small, highly specialized farms have a higher demand for municipal services, they pay more taxes than mixed grain and livestock farms; and thus they too help defray the deficit incurred by the non-farm population.

Both the Louth and Westminster Township studies concern the fringe areas of small cities in Ontario. More research will be necessary to determine whether these conclusions also apply to the fringe areas of much larger cities, and whether they apply to cities outside of Ontario where the basis of tax assessment may be considerably different.

On the basis of the Louth and Westminster Township studies, it appears that a complete reappraisal of the municipal tax structure in rural -urban fringe areas is needed. Certainly the property tax leaves something to be desired as a means of spreading governmental costs according to a benefits-received principle.

If property tax is to remain the major source of income, there are several things a fringe municipality can do to alleviate the tax burden on farms. The required minimum value of new non-farm dwellings can be increased to the point where they will pay for their own costs of services. The municipality can attract industry and commerce whose tax credit will help to offset the deficit of the non-farm population. By combining school sections into one township school area, not only can total educational expenditures be reduced, but also industrial and commercial assessment can be equally applied to all parts of the municipality, thus reducing the farm load in those areas which have had the greatest influx of population.

However, these are only palliatives, not cures. The basic problem is the lack of planning which has permitted cities to sprawl in a haphazard manner over the surrounding farmland. And the major hindrance to sound planning of the development of the whole urban and fringe area is that, in this day of two autos per family, we are still using municipal boundaries designed for the horse-and-buggy age. There is need for a complete readjustment of municipal boundaries, perhaps using the "city region" as the basic municipal unit.

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